

## Points

- FDG-PET/CT is an excellent tool for the lymphomas
- It is useful in the diagnosis, initial staging and assessing response to therapy as well as for follow-up
- Of all modalities available, PET/CT is currently the most sensitive and specific modality for this

## PET/CT in Lymphoma

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PET/CT can optimize the management of lymphoma patients in 2 principal domains:

- improving the accuracy of initial staging,
- assessing the response to treatment earlier, more accurately and for follow-up

### FDG avidity:

The lymphomas are generally FDG avid. Hodgkin's disease (HD) is highly FDG avid. The non-Hodgkin lymphomas (NHL) have some tendency to have FDG uptake that is similar to their aggressiveness. However, small lymphocytic lymphomas, marginal zone lymphomas, including MALT lymphoma and peripheral T-cell lymphomas may not be FDG-avid.

### A. Initial staging:

While histologic evaluation is essential for diagnosing the type of lymphoma and subsequent management decisions, accurate staging relies on imaging.

PET/CT is more accurate than other imaging modalities like USG, CT scan and MRI for detecting lymph node, organ and bone involvement with higher sensitivity and specificity (Figure 1). It allows the diagnosis of disease in normal-sized nodes as well. While focal uptake on PET/CT suggests bone marrow involvement, a negative PET/CT does not exclude marrow lymphoma. PET/CT improves the accuracy of staging and appropriately upstages or downstages the disease and in turn leads to better disease management.



Fig. 1

Figure 1: PET/CT done for staging in this patient who was diagnosed to have NHL from a neck node biopsy. PET scan shows extensive disease in the lymph nodes, lung, brain and bones.



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## B. Evaluation of treatment response and follow-up:

PET/CT is the imaging technique of choice for the evaluation of treatment response in patients with lymphoma.

Significantly longer progression free survival is seen in patients who are PET negative after two cycles of chemotherapy (Figure 2). Residual disease on PET after two cycles of chemotherapy is associated with higher chance of relapse. PET/CT at mid-treatment is a stronger prognostic factor for progression free survival and overall survival. A residual mass on CT scan (Figure 3) should be considered truly negative when corresponding to 'cold' areas on PET/CT.

It is better to perform PET/CT before the start of radiotherapy or to wait at least 3 months after completion of radiotherapy to avoid false positives due to inflammatory changes. After chemotherapy, PET/CT can be done with a gap of 3 to 6 weeks for the end of treatment assessment or just before the beginning of the next chemotherapy cycle for the interim assessment (Figure 4).

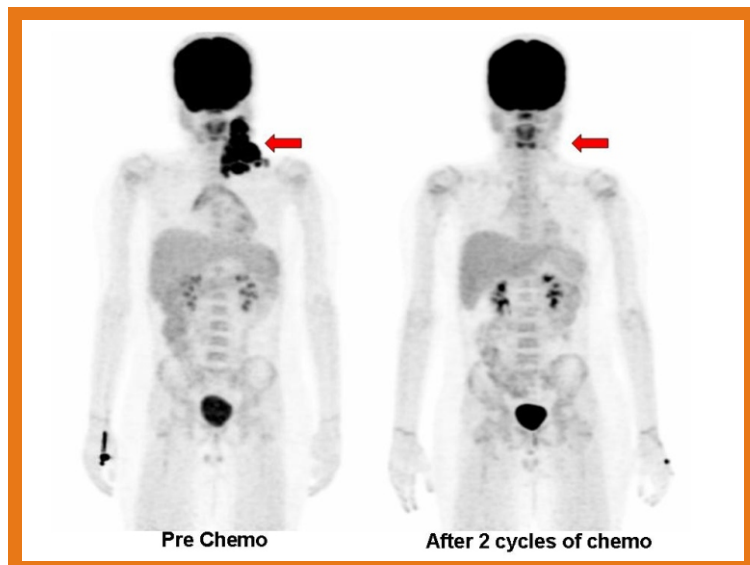


Fig. 2

Figure 2: PET/CT shows complete response after 2 cycles of chemotherapy in this case of Hodgkin's disease who had large left sided neck nodes (arrow).

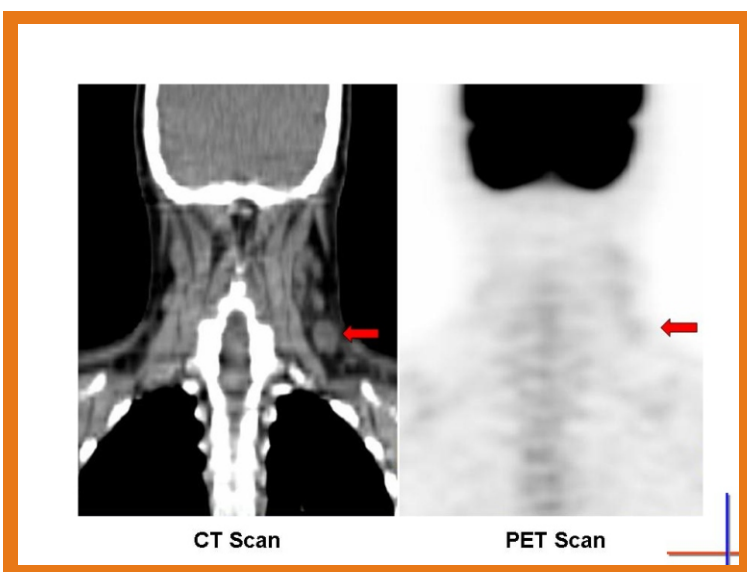


Fig. 3

Figure 3: Residual lymph nodes are seen on the CT scan (arrow) in this patient of Hodgkin's disease after 2 cycles of chemotherapy. However, on the PET scan no corresponding metabolic activity is seen (arrow), indicating complete response to treatment.

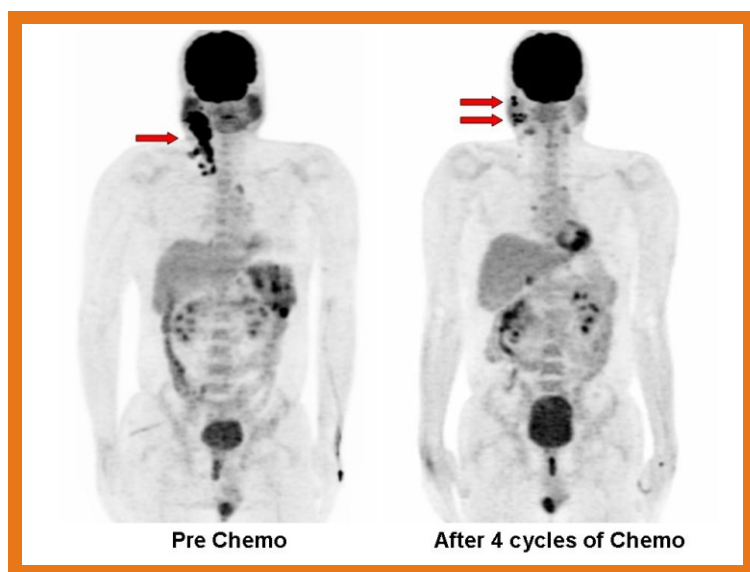


Fig. 4

Figure 4: After four cycles of chemotherapy, the large lymph node mass (arrow) seen pre-chemotherapy has regressed, but new lesions are seen (arrows), in this patient with NHL.

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