Special Feature: PET-CT in re-staging and treatment response evaluation

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Positron emission tomography computed tomography (PET-CT) is a well recognized, powerful imaging technology that holds great promise in early diagnosis and treatment of many diseases especially cancers and hidden infections. A single examination allows survey of the entire body. Within few minutes, this provides a comprehensive picture, making it easier to diagnose pathological processes and determine its extent in the body thus helping in selection of optimum treatment, and in tracking progress, during the follow-up visits of the patients.

Important indications include

(i) Staging of cancer: this investigation provides information accurate enough to alter mode of treatment in 30%-40% of patients;

(ii) Assessment of response to a given treatment, by quantifying the decrease in metabolic activity and size of tumor in comparison to pre treatment scan;

(iii) Restaging of cancer after completion of treatment to see the residual disease; and

(iv) Follow-up after a long disease free interval in both symptomatic and asymptomatic patients.

In this procedure, patients receive a small injection of a radioactive material fluorodeoxy glucose (¹⁸F FDG). Tumour or infective focus will concentrate ¹⁸F FDG, which will be seen as a metabolically active or lighted up area in PET image and all such abnormal sites will be localized in a single test. The following case summary illustrates the key issues described above.

A 52-year-old male patient, was treated for Hodgkin's disease. After a six-year interval the patient presented again with relapse of disease in the left inguinal region. Pretreatment PET-CT (Figure 1A) revealed extensive, metabolically active variable sized lymph nodes in left side inguinal,

external iliac. common iliac. retroperitoneal, and mediastinal lymph nodes. Patient was retreated with 6 cycles of ABVD regimen of chemotherapy. Post ¹⁸F FDG whole body repeat therapy, PET-CT (Figure 1B) shows,complete metabolic response and significant reduction in size of the involved nodes. It may be noted that focal FDG concentration is also noted in pre and post-treatment PET-CT in lower part of neck (representing a left sided thyroid nodule); a co-incidental finding, not related to Hodgkin's disease. Thus, PET-CT has become a new and reliable imaging tool of valuable help for clinicians managing cancer patients as provides the advantages of this both structural and functional imaging.



Figure 1: A) Pretreatment B) Post-treatment, PET, maximum intensity projection (MIP) image in the top and PET CT fused axial image in bottom with arrow mark.

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