

FDG PET imaging in Gynaecology

The time has come for the South African medical community to graduate from viewing PET as "Pretty Expensive Technology" or "Promising Emerging Technology". For Positron Emission Tomography (PET) with F-18 fluoro-2-deoxy-D-glucose (FDG) is now the standard of care in initial staging, monitoring the response to therapy, and management of various cancers.¹ This is due to fact that PET is a molecular imaging procedure that allows us to obtain three-dimensional images of what is happening in a patient's body at the molecular and cellular levels. The commonly used radiopharmaceutical, FDG, which is an analogue of glucose, provides qualitative and quantitative metabolic information that is valuable for diagnosis and management of tumors or cancer cells.¹ Of importance, PET is now combined with morphologic information obtained with CT.

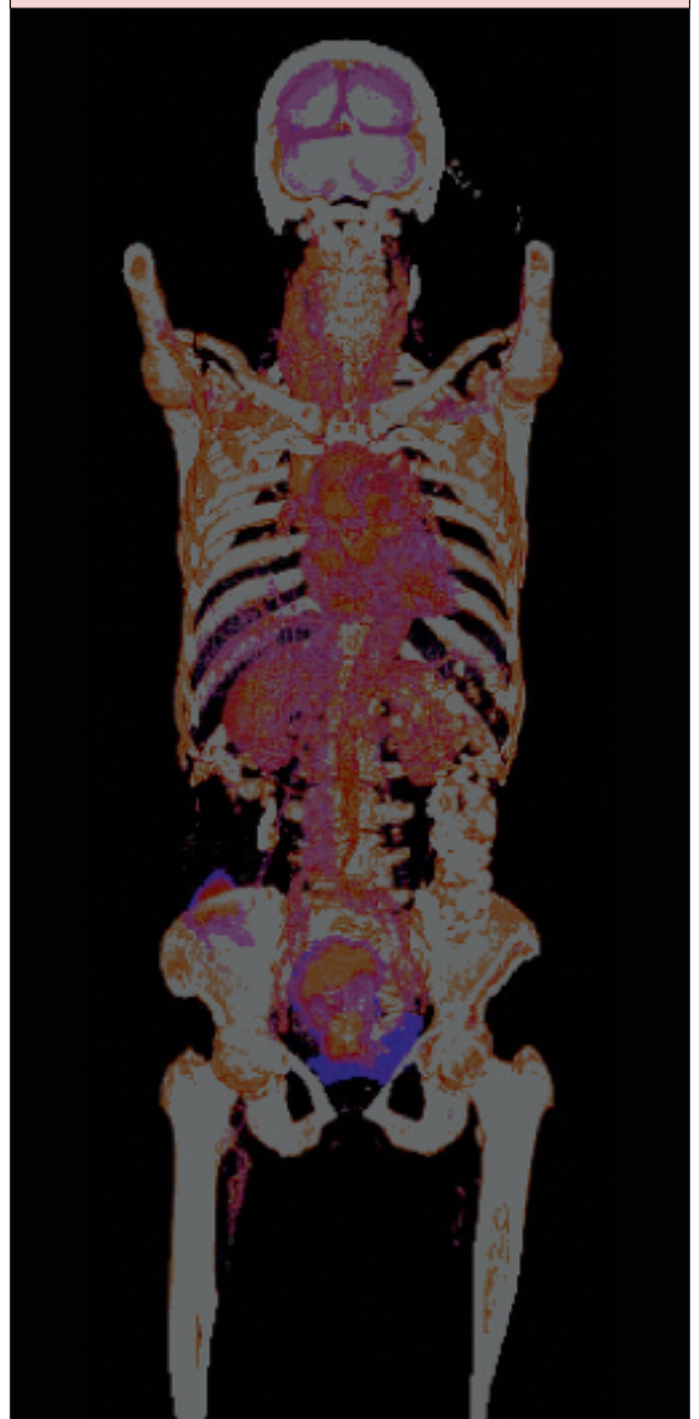
Whilst many gynaecological cancers are staged clinically using the International Federation of Gynecology and Obstetrics (FIGO) staging system, imaging can be a useful adjunct to clinical staging. Alas, globally and more-so in South Africa, 18F-FDG PET/CT imaging is underutilized in patients with gynaecologic malignancies, and its role in current clinical practice has yet to be established.

The gynecological community of South Africa needs to be aware that in recent years, FDG-PET/CT has emerged as a powerful imaging tool in gynecologic cancer. In cervical cancer, FDG-PET/CT is used in initial disease assessment, it has high sensitivity in detection of nodal disease², this is of special importance to our population, especially since pelvic and para aortic lymph nodal involvement are the most important prognostic factors in advanced cervical cancer: metastases to these nodes are associated with significantly lower survival rates.³ FDG-PET/CT is thus probably most suitable in patients with negative or ambiguous findings on other types of radiographic imaging. Data support its usefulness in asymptomatic cervical cancer patients with high tumor markers and negative conventional-imaging findings, although more data are needed to ascertain whether it has a positive impact on survival.³ Similarly, its role in monitoring response to therapies needs to be consolidated, to which South Africa with its specific disease demographics and level of medical advancement is well placed to take the lead.

For ovarian cancer, most patients will still be diagnosed in advanced stage and often managed by neoadjuvant treatment. PET/CT will here not add significant changes in management. PET/CT shows to be useful, however, in chemoradiation response assessment and may provide prognostic information.⁴ Although further investigation is necessary, especially for ovarian cancer, PET/CT could be conceivably be used to guide further treatment. On the other hand, there is a large agreement among authors that PET/CT have proven its added value over conventional imaging in detecting relapse: clinicians should consider allocating PET/CT a routine role in selected patients with suspicion of relapse based on clinical findings and, for ovarian cancer, on rising CA-125 levels, to correctly guide decision-making.⁵

The role of FDG-PET/CT in endometrial cancer is relatively less defined because of the limited data in the literature. Several workers are however starting to delineate its usefulness in detection of relapse, in which FDG-PET/CT seems to add value over conventional imaging.⁶

Enlarged hypermetabolic uterine carcinomatous mass along with hypermetabolic right adnexal lesion, possibly a concomitant ovarian tumor demonstrated with volume rendered FDG PET/CT with integrated contrast CT.F R 22 | C A



Scanty studies have been reported in the management of vulvar cancer using FDG-PET/CT. More data are needed. Gestational trophoblastic neoplasia is quite unique in biological behavior and clinical management. Some of the preliminary results suggest that FDG-PET/CT is potentially useful in selected gestational trophoblastic neoplasia by providing a precise metastatic mapping of tumor extent upfront, monitoring response, and localizing viable tumors after chemotherapy.⁷ In vaginal cancer, PET was found more accurate in detecting primary tumor and nodal disease compared with CT.

FDG-PET/CT has not only become an established imaging tool in oncology it is now of growing interest in the field of infectious and inflammatory diseases. Increased uptake is also observed in inflammatory cells because of high-metabolic requirements.⁸ Accumulation of FDG at sites of infection or inflammation may cause false-positive PET results when this imaging technique is used in the workup of suspected or known malignancy. In contrast, the high level of FDG uptake at infection and inflammation sites also gives a powerful tool to approach the diagnosis in patients with FUO (fever of unknown origin).⁸ With our challenge of having a high population of HIV and TB, symptoms are often nonspecific such as fever without any localizing features FDG-PET imaging may play a major role by detecting the site of infectious, inflammatory and neoplastic processes, hence targeting further diagnostic procedures.

Points to emphasize are that accurate imaging allows individualised therapies. And of the various imaging modalities available, FDG-PET/CT emerges as a valid supplement to the FIGO staging procedure, assessing lymph node status, adding prognostic information in patients with newly diagnosed (stage \geq 1B), locally advanced or relapsed cervical cancer and providing data useful for treatment planning.

In patients with ovarian cancer, PET-CT is the most accurate imaging modality for detecting tumor recurrence and planning salvage therapy. Its role in the care of patients with endometrial cancer, while promising, has yet to be

defined.

Perhaps soon it will be clearly demonstrated that PET/CT is superior to conventional imaging without extrapolating work from developed countries, it could even replace the single imaging procedures, with advantage on time, costs and patient stress sparing. Especially if there was provision of PET/CT's in at least all university hospitals.

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