

The value of PET-CT imaging in the evaluation of primary and secondary skeletal tumours

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The role for FDG PET/CT in the evaluation of primary bone tumours is still evolving but there is evidence to suggest there may be additional information that is clinically useful for the purposes of initial staging and for assessing the response to neoadjuvant chemotherapy prior to surgery. There is also some evidence that co-registered FDG PET and MRI may be helpful in guiding biopsies at the time of diagnosis.

Bone scintigraphy augmented with radiographs or cross-sectional imaging, such as computed tomography (CT) or magnetic resonance imaging (MRI), has remained the commonest method to diagnose and follow up skeletal metastases. However, bone scintigraphy is associated with relatively poor spatial resolution, limited diagnostic specificity and reduced sensitivity for bone marrow disease. It also shows limited diagnostic accuracy in assessing response to therapy in a clinically useful time period. With the advent of hybrid positron emission tomography PET/CT scanners there has been an increasing interest in using various PET tracers to evaluate skeletal disease including ^{18}F -fluoride as a bone-specific tracer and ^{18}F FDG and ^{18}F -choline as tumour-specific tracers.

Different aspects of tumour biology can be assessed, including osteoblastic activity (^{18}F -fluoride) and tumour cell metabolism (^{18}F FDG and ^{18}F -choline). The improvement in imaging skeletal metastases is further enhanced with hybrid imaging. PET/CT has already shown some advantages over PET and with the future development of PET/MRI, there is potential for further advances in non-invasive assessment of the skeleton and bone marrow.

In the future it may be possible to use tracers to image other aspects of bone biology and in particular there is the potential to measure and monitor osteoclast activity.

References

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