

PET SCAN AND MRI

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Lytic bone disease is a major feature of multiple myeloma (MM): 70-80% of patients have osteolytic lesions at diagnosis, while up to 90% develop lytic lesions during the course of their disease. Conventional radiography (whole-body X-rays, WBXR) is the most common technique for the evaluation of bone disease in MM patients. However, WBXR has several limitations: it reveals lytic disease when over 30% of the trabecular bone has been lost, while it cannot be used for the assessment of response to therapy and it has very low sensitivity for the pelvis and spine. Thus, whole-body low-dose CT (WBLDCT) has been suggested by the EMN to substitute conventional radiography as the standard technique for the evaluation of bone disease in MM. Furthermore, lytic lesions detected by CT have been included in the new criteria for the definition of symptomatic MM.

Positron Emission Tomography/Computed Tomography (PET/CT): F18-fluorodeoxyglucose-PET/CT is a reliable imaging technique for the detection of bone disease in MM. PET/CT is recommended for the staging of solitary plasmacytoma and for the evaluation of patients with suspicion of extramedullary presentation and/or progression especially in cases with oligo- or hypo-secretory myeloma or rising LDH. PET/CT provides also prognostic information mainly in patients who underwent an autologous transplantation. Finally, it is possibly the best imaging technique for the more accurate assessment of CR and for the better evaluation of extramedullary minimal residual disease (MRD) after anti-myeloma therapy. The standardization of the method and availability issues are major problems for its wider use in MM.

Magnetic Resonance Imaging (MRI). MRI is an excellent method for the imaging of axial skeleton and for distinguishing benign versus malignant osteoporotic vertebral fractures. MRI has the ability to detect spinal cord/nerve compression and the presence of soft tissue masses and it is also recommended for the work-up of solitary plasmacytoma. Regarding smoldering/asymptomatic myeloma, all patients should have a WB-MRI (or spine and pelvic MRI if WB-MRI is not available) and if they have >1 focal lesion of a diameter of >5 mm, they should be considered as having symptomatic disease that requires therapy. In the cases of equivocal small lesions then a second MRI should be performed after 3-6 months and if there is progression in MRI then the patient should be treated. Newer MRI techniques that include diffusion-weighted imaging MRI, dynamic contrast-enhanced MRI and PET-MRI may be able to better define CR and MRD and therefore may help to guide treatment in the near future.