DIAGNOSTIC IMAGING PATHWAYS

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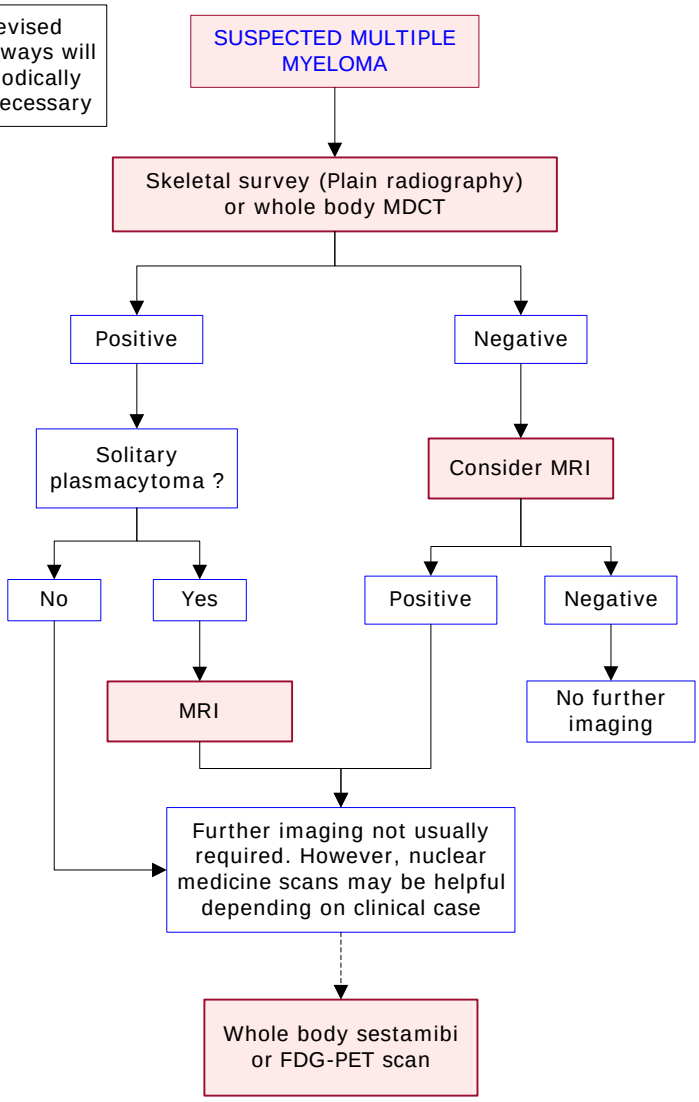
Pathway last revised August 2010.Pathways will be reviewed periodically and updated as necessary



PLAIN RADIOGRAPHY/SKELETAL SURVEY

- Primary method for evaluating skeletal involvement by multiple myeloma. [1,2]
- Approximately 80% of patients with myeloma will have detectable lesions on skeletal survey, most commonly affecting the vertebrae, ribs and skull. [10]
- Able to detect lytic lesions, fractures and osteoporosis. [1]
- Limitations:
    - Some areas not well visualised (eg, scapulae, ribs, sternum)
    - Limited sensitivity with up to 20% false-negatives [10]
    - Cannot distinguish myeloma-related osteoporosis from steroid-induced or postmenopausal osteoporosis
    - Lengthy study requiring multiple films with different patient positions

MULTIDETECTOR COMPUTED TOMOGRAPHY

- Multidetector CT allows for the detection of small osteolytic lesions with rapid acquisition times and three dimensional multiplanar reconstruction. This modality has replaced the conventional skeletal survey in some centres. [10]
- Demonstrates superior sensitivity compared to plain radiography and able to better visualise areas such as the scapulae, ribs and sternum. [11,12] Also characterises trabecular anatomy in detail to differentiate benign and pathological compression fractures. [9]
- May reveal unsuspected associated pathology such as soft tissue and visceral masses which may be more easily biopsied.
- Provides estimation of fracture risk. [8]
- Main limitation is the exposure to ionising radiation.

MAGNETIC RESONANCE IMAGING

- Highly sensitive modality for the detection of myeloma-related bone lesions. Allows visualisation and assessment of the degree of malignant infiltration of the medullary cavity. It can effectively distinguish benign and malignant compression fractures. [10]
- MRI is also the modality of choice for suspected cord compression. [10]
- In comparison to the conventional skeletal survey and MDCT, MRI demonstrates higher sensitivity for the detection of bone lesions. [13,17]
- According to current guidelines, MRI should be considered in symptomatic patients with a negative skeletal survey. [10] Whole body MRI is preferable, however, MRI of the spine and pelvis is also helpful if resources are limited.
- In patients with apparent solitary plasmacytoma on skeletal survey, MRI of the spine should be performed to exclude occult lesions. [10]

WHOLE BODY SESTAMIBI OR POSITRON EMISSION TOMOGRAPHY (PET)

- 99mTc-sestamibi, 18FDG-PET and PET/CT are all useful additional diagnostic tools for detecting occult myeloma-related lesions. Sestamibi scans correlate well with disease activity. 18 PET/CT is a relatively new modality which overcomes the problem of spatial resolution with PET alone by combining with CT. This fusion scan demonstrates a sensitivity of 85% for the detection of myeloma deposits. 19
- In comparison to MRI, both sestamibi and PET/CT scans show a lower sensitivity for the detection of bone lesions. 20
- Based on current guidelines, neither sestamibi or PET scans are recommended for routine use in the diagnosis and management of myeloma patients. 10 However, both modalities may be useful to clarify the findings on previous imaging in selected cases, although further studies are required to support this role.
- Traditional technetium bone scintigraphy may detect up to 60% of lytic lesions in myeloma. However, it demonstrates a lower sensitivity and specificity compared to plain radiography which is due to osteoblastic dysfunction in myeloma. 10 Other modalities should be used in preference in the diagnosis and monitoring of patients.

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