Spinal metastases diagnosis

Magnetic resonance imaging is the most sensitive imaging modality for the detection of spinal metastases, but plain x-rays, computed tomography, and 18F positron emission tomography play a role in diagnosis and management.

Magnetic resonance imaging (MRI)

Early diagnosis is of the utmost importance to prevent neurological deficit due to spinal cord compression. Magnetic resonance imaging (MRI) has become the final tool in that diagnostic process. However, access to MRI is still limited, requiring cost-effective use. It is generally acknowledged that patients with systemic cancer who present with a radiculopathy or myelopathy should undergo an MRI. However, the diagnostic policy in patients with systemic cancer who present with recently developed back pain is still a matter of debate.

Selection of patients with cancer with back pain at risk of SEM was not possible with the standard neurological checkup. After intake by the neurologist, the next step should be MRI of the whole spine ¹⁾.

MRI proved superior in detecting bone and epidural involvement by tumor and was valuable in clinical decision making. In addition, MRI provided better visualization of paravertebral soft tissue involvement by tumor. MRI is recommended as the initial study in patients with suspected metastatic spinal disease².

It provides excellent visualization of soft tissue involvement, bone marrow replacement, ligament involvement, degree of canal compromise, cord edema, and cord compression. The overall accuracy of MRI is 95% (sensitivity 93%, specificity 97%)³

Plain X-rays

Most spinal mets are osteolytic, but at least 50% of the bone must be eroded before plain X-rays will be abnormal.

Not very specific. Possible findings: pedicle erosion (defect in "owl's eyes" AKA "winking owl sign" on LS or thoracic spine AP view) or widening, pathological compression fracture, vertebral body (VB) scalloping, VB sclerosis, osteoblastic changes (may occur with prostate Ca, Hodgkin's disease, occasionally with breast Ca, and rarely with multiple myeloma)

Most of the spinal epidural metastases are osteolytic, but at least 50 % of the bone must be eroded before plain x ray abnormality

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Not very specific.

see Winking owl sign

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Plain x-rays are quite good at evaluating bony metastases, but not good at evaluating the spinal cord and surrounding soft tissues. Metastatic epidural spinal cord compression most commonly occurs at the site of vertebral involvement on plain x-ray, especially where there is evidence of vertebral collapse. Most common findings on x-rays include pedicle erosion, paravertebral soft shadow, vertebral collapse, and pathologic fracture or dislocation ⁵⁾.

In the past, if there was back pain or a localizing sign and spinal x-ray was abnormal, the probability of epidural disease was 0.9, but if the x-ray was normal, the probability was only 0.1^{6} .

In 1990, x-rays were found to have a 10% to 17% false negative rate 8 .

The rate of missed metastatic epidural spinal cord compression is unacceptable.

18F positron emission tomography

see 18F positron emission tomography for bone metastases

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