

FAST FACTS AND CONCEPTS #237
EVALUATION OF SPINAL CORD COMPRESSION

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Background Malignant epidural spinal cord compression (SCC) is a common and devastating complication of cancer (see *Fast Fact #62*). If not diagnosed and treated in a timely manner, SCC can lead to permanent weakness, paraplegia, and loss of bowel and bladder control. This *Fast Fact* discusses the clinical features and diagnosis of SCC in adults. *Fast Fact #238* discusses its management.

Epidemiology Breast, lung, prostate, and multiple myeloma are the most common cancers causing SCC. Cumulative incidence of SCC in the 5 years preceding death is roughly 8% in multiple myeloma, 7% in prostate cancer, 5.5% in breast and 3% in lung cancer patients. The thoracic spine (70%) is the most common site of SCC because of its narrow epidural space and dense vascularization, followed by the lumbosacral (20%) and cervical spines (10%). Hematogenous spread (both arterial and venous) to the vertebral bone and subsequent growth into the epidural space is the most common mechanism of metastasis to the epidural space, although direct invasion through the neural foramen can also occur. Once in the epidural space, tumor may spread in any direction, including pressing on the dura mater causing ischemia and demyelination of the spinal cord.

Symptoms Symptoms usually present in a progressive manner from pain to neurologic deficits. Back pain is the most common and the most sensitive symptom in SCC (>90%), but is non-specific. It can be localized (20-80%), radicular (40-60%), or mechanical (14%), and can worsen with recumbent position (20%) or coughing or sneezing (35-40%). Back pain that is new or changing should raise one's suspicion of SCC. Pain may be present for 2-3 months before neurological symptoms develop. Motor deficits are more specific for SCC than pain, but present late in its course. The time from the onset of weakness to frank paraplegia can range from less than 24 hours to many weeks. Motor symptoms include progressive motor weakness (60%-95%), ataxia, and subsequently total paralysis. Sensory deficits are less common than motor symptoms (40%-80%). Autonomic symptoms, including bladder (50%) and bowel (75%) complaints occur last in the disease process. These include urinary hesitancy (14%), retention (25%), incontinence (15%), constipation (66%), and fecal incontinence.

Signs Physical examination can reveal weakness (85%) and a sensory level of deficit (50-60%), but there is poor correlation between the level of pain and the actual level of compression. More than half of patients with upper thoracic compression present with lumbosacral pain and vice-versa (7). A clinically detected sensory level abnormality is also poorly correlated (16%) with the level of compression identified on MRI.

Risk Factors In cancer patients with suspected SCC, the following factors have been associated with an increased risk of having SCC compared to patients without these characteristics: age less than 60 years, inability to walk, middle or upper back pain, abnormal neurologic examination, presence of spinal metastases, radiographically diagnosed compression fractures, bone metastases diagnosed more than 1 year earlier, and metastatic disease at initial cancer diagnosis (3,4).

Imaging Because symptoms poorly correlate with compression level, and SCC can occur at multiple levels simultaneously, imaging of the entire spine is recommended. MRI (without contrast) is the imaging modality of choice because of its high sensitivity (93%) and specificity (97%). In addition, MRI reveals if there is compression of the cord versus nerve roots and can provide useful information about the spine's stability. CT myelography has sensitivity and specificity close to that of MRI, and can be used in patients who cannot get an MRI. Plain films are not sensitive and cannot rule out either vertebral metastases or SCC. If they show vertebral lesions in a suspected area, however, that should increase one's suspicion of SCC and prompt further investigation. Bone and PET scans can show the presence of vertebral metastases but do not provide information about compression of the spinal cord. CT scans are not recommended due to poor revelation of the epidural space and spinal cord.

Conclusion New or worsening back pain in cancer patients *with or without* neurological deficits should be evaluated urgently for SCC. Clinicians should have a very low threshold to image a patient's entire spine with MRI. If a patient has developed any neurologic deficits, glucocorticoids should be administered (see *Fast Fact #238*) and total spine MRI should be performed emergently.

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Version History: Originally published December 2010; Copy-re-edited November 2015.

Fast Facts and Concepts are edited by Sean Marks MD (Medical College of Wisconsin) and associate editor Drew A Rosielle MD (University of Minnesota Medical School), with the generous support of a volunteer peer-review editorial board, and are made available online by the [Palliative Care Network of Wisconsin](#) (PCNOW); the authors of each individual *Fast Fact* are solely responsible for that *Fast Fact's* content. The full set of *Fast Facts* are available at [Palliative Care Network of Wisconsin](#) with contact information, and how to reference *Fast Facts*.

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