A Different View: Unenhanced Computed Tomography versus Magnetic Resonance Imaging Scans in Metastatic Spinal Cord Compression

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Metastatic spinal cord compression (MSCC) is a medical emergency requiring rapid diagnosis and intervention to avoid irreversible neurological damage [1]. While MSCC is best diagnosed by magnetic resonance imaging (MRI), this modality is often limited and is usually preceded by a computed tomography (CT) scan of the spine.

PATIENT DESCRIPTION

A 69-year-old woman presented with having had progressive back pain for a few weeks. During that time she underwent a thoracic and lumbar spine X-ray as well as pelvic X-ray, both of which were normal. She also underwent a non-contrast CT of the cervical, thoracic, and lumbar spine, which demonstrated no vertebral masses or lytic lesions, no soft spondylolisthesis, and no soft tissue mass [Figure 1A]. However, a random finding of multiple pulmonary nodules, highly suspicious for metastatic disease, was noted. She was referred to the emergency department for a full workup.

At admission, the patient described several weeks of progressive back pain exacerbated by movement, coughing, Valsalva maneuver, and supine position. These symptoms were joined by epigastric pain with belt-like radiation pattern. She also noted difficulty walking. No bowel or bladder dysfunction nor urinary or fecal incontinence were present.

Physical examination revealed symmetric weakness of lower extremities and a symmetric sensory deficit starting at the level of T7, which the patient referred to as being *touched through wax*. Unstable, wide-based gait was observed. Anal tonus was preserved.

The patient promptly underwent an MRI scan of the spine with Gadolinium injection. The scan revealed diffuse enhancement of the vertebral body and posterior elements of the 4th thoracic vertebra, with extension to the epidural space compressing the spinal cord at this level [Figures 1B, 1C]. Due to these findings the patient was treated with dexamethasone and underwent emergent surgery consisting of tumor resection and T4–T5 laminectomy.

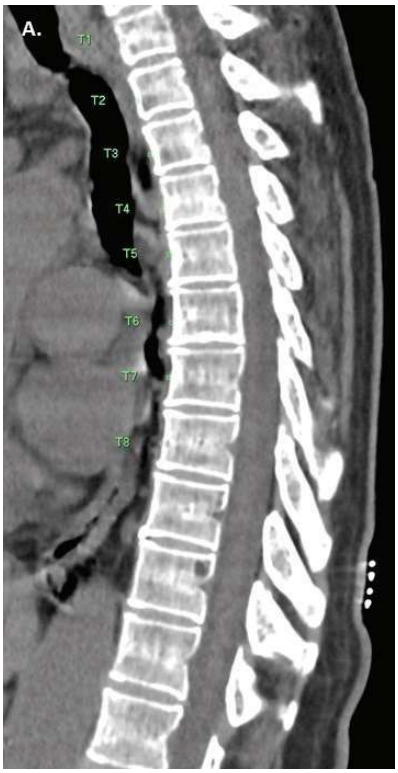
COMMENT

The comparison between imaging modalities demonstrated how, in the absence of skeletal involvement, a non-contrast CT scan is of low sensitivity for detecting spinal-canal masses. Spinal cord compression (SCC) is associated with lytic multiple myeloma or with marrow-stemming hematologic malignancies. It usually involves bone lesions and is thus identifiable on unenhanced CT scan [2,3]. In contrast, solid tumor metastases might compress the spinal canal due to their bulky character (MSCC) without significant skeletal abnormality. These masses may therefore be poorly demonstrated by unenhanced CT, thus a negative study cannot rule-out cord disruption. MRI of the entire spine is the scan of choice for a patient with suspected MSCC and reveals a sensitivity of 93% and specificity of 97% [2]. We emphasize that, on suspicion, a prompt whole-spine MRI scan is of crucial importance for adequate patient care.

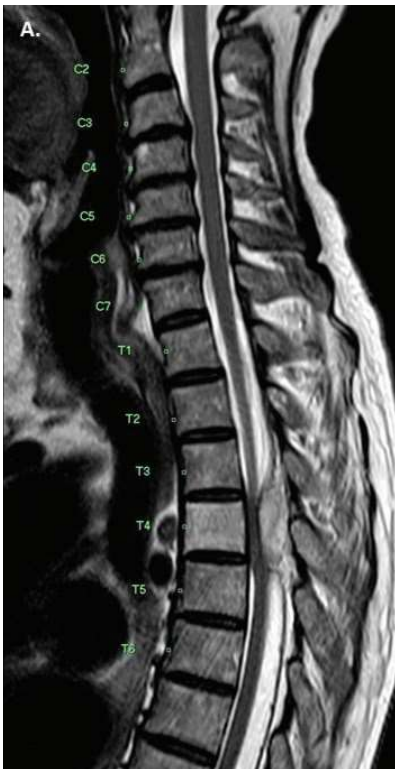
Figure 1. Computed tomography of the cervical, thoracic, and lumbar spine

MRI = magnetic resonance imaging

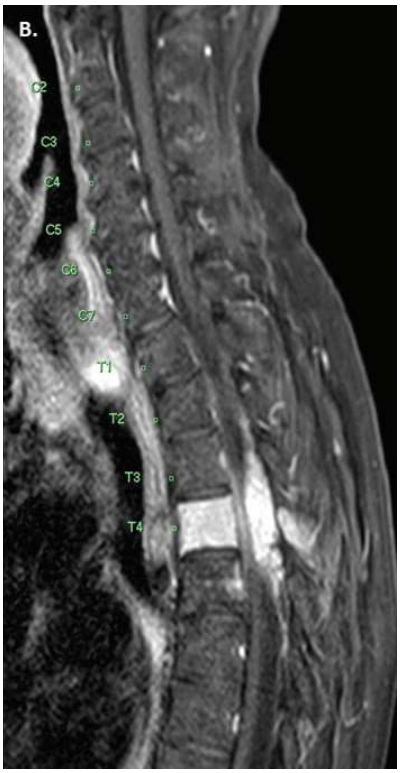
[A] Sagittal reconstructed image from an unenhanced computed tomography scan of the thoracic spine with normal appearing vertebrae and no apparent soft tissue mass in the vertebral canal



[B] MRI of cervical and thoracic spine performed 2 weeks later. Sagittal T2 weighted MRI image showing hyperintensity of the 4th thoracic vertebral body and a posterior epidural vertebral canal mass compressing the spinal cord



[C] Sagittal T1 weighted MRI image post Gadolinium injection showing diffuse enhancement of the 4th thoracic vertebral body with extension to the epidural space forming the posterior vertebral canal mass



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Capsule

Immune checkmate

Virulence factors produced by *Candida albicans* contribute to its pathogenicity and ability to infect the brain but inadvertently may facilitate the detection of the fungus by brain-resident immune cells. **Wu** et al. explored mechanisms by which aspartic proteinases, called Saps, and the cytolytic toxin candidalysin may activate microglia. In vitro, Saps cleaved amyloid precursor protein (APP), a molecule expressed by neurons, to generate peptides that activated antifungal activity through Toll-like receptor 4 (TLR4). In addition, the authors found that candidalysin could bind to the integrin CD11b and that loss of either protein impaired the clearance of *C. albicans* from the brains of infected mice.

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