

## CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

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### Medical Imaging Quiz – Case 16

A 35-year-old female presented to the emergency department (ED) complaining of fever, cough, loss of weight, and low back pain of one month's duration. Past medical history was negative. A week ago, she suffered a sudden and intense pain in her back which precipitated a fall. Since that time, she has had difficulty walking and developed fever.

Physical examination revealed a mildly distressed patient. Her pulse was 94 beats/min, and blood pressure was 140/90 mmHg. Pulmonary and abdominal exams were within normal limits. She had pain to palpation in the thoracic area, but doctors detected no inflammatory signs. Neurologic exam was normal. CBC: Hb 9.2 g/dL, Hct 30%, WBC 9,200/ $\mu$ L.

A radiograph of the thoracic region was ordered and demonstrated a right summit lesion (fig. 1), elevation of the right diaphragm (fig. 2) with osteolysis in the middle of the arch of the 7th rib and disc space narrowing in C7. A technetium-labeled bone scan showed increased activity in C7, and focal increased activity in 7th and 9th ribs (probably secondary to previous trauma). CT of the spine showed destruction of the vertebral



**Figure 1.** A radiograph of the thoracic region demonstrated round lesion in the right upper pulmonary zone.



**Figure 2.** A chest Rx demonstrated elevation of the right diaphragm with osteolysis in the middle of the arch of the 7th rib and disc space narrowing in C7.

ARCHIVES OF HELLENIC MEDICINE 2011, 28(1):134–136  
ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2011, 28(1):134–136

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**K. Stathopoulos,  
N. Sidiropoulou,  
P. Filippousis,  
L. Thanos**

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*Department of Computed Tomography  
and Interventional Radiology, "Sotiria"  
General Hospital of Chest Diseases,  
Athens, Greece*

body and fragmentation of vertebral endplates of C6–C7, disc height loss, paravertebral effusion with calcifications, paratracheal, hilar and subcarinal lymph node enlargement with rim enhancement and central necrosis (figures 3, 4). Blood and urine cultures were negative.

#### Comment

*Spinal infections are uncommon, accounting for only 2% to 4% of all osteomyelitis infections. The most common method of spinal infection is through the arterial spread of pyogenic bacteria.*



**Figures 3, 4.** CT of the spine showed destruction of the vertebral body and fragmentation of vertebral endplates of C6–C7, disc height loss, paravertebral effusion with calcifications, paratracheal, hilar and subcarinal lymph node enlargement with rim enhancement and central necrosis.

*Bacterial spondylodiscitis is an infection of the intervertebral disc and the adjacent vertebral bodies. It usually starts at the interface of the disc and the vertebra. Infection follows the hematogenous route from a distant site such as urinary tract infection, prostatitis, endocarditis, intravenous drug use, and cutaneous infection, including furunculosis. Most common symptoms are back pain and fever. Neurologic manifestations of paraparesia, paraplegia, and meningitis can be found when the etiology is tuberculosis or Staphylococcus.*

*Diagnosis is confirmed by spinal X-ray, computed tomography (CT), magnetic resonance imaging (MRI), and bone scan. Although plain images, radiographs, CT scans, and nuclear medicine studies can help to establish the diagnosis of spondylodiscitis, MRI is considered the modality of choice for evaluating the presence and severity of spinal infection. MRI is especially effective for evaluating the neural structures of the spine (i.e., spinal cord, nerve roots) and extradural soft tissue. Along with appropriate history taking, physical examination, and positive blood cultures, findings on MRI or radionuclide studies may confirm the diagnosis. CT scanning is most useful for characterizing vertebral osteomyelitis in patients with subacute or chronic illness. CT scanning provides radiologic guidance for interventional procedures (i.e., biopsy, drainage). Conventional radiographs are insensitive to the acute changes seen in cases of spondylodiscitis, but they may be used on a limited basis in the follow-up of chronically ill patients.*

*An echocardiogram should be ordered whenever a Streptococcus sp is isolated, to rule out concomitant infectious endocarditis; there is a reported association between spondylodiscitis and infectious endocarditis. Blood and urine cultures are also helpful to isolate the pathogen involved. Sputum and urine specimens need to be sent for direct examination and culture when M. tuberculosis is suspected.*

*Percutaneous discovertebral biopsy is useful and relatively safe when a bacterium is not isolated by the previously mentioned methods, especially when tuberculosis (TB) is a concern. Fine-needle aspiration and open biopsy have also been employed. M. tuberculosis is a common pathogen, and pulmonary signs and symptoms may also be present. Gram-negative bacilli, Staphylococci (*S. aureus* and *S. epidermidis*), as well as Streptococci (*S. bovis*, *S. sanguis*, *S. pyogenes*; *Enterococcus faecalis*) are the most common non-TB bacteria involved. The most common sites of infection are lumbar, thoracic, and cervical.*

*Initial therapy includes intravenous administration of antibiotics for 2 to 4 weeks in non-TB cases, followed by a 1- to 3-month course of an oral regimen. When M. tuberculosis is isolated, specific therapy including rifampicin, isoniazid, and pyrazinamide is prescribed for 9 to 24 months. Surgical treatment is reserved for patients with neurologic signs of spinal cord compression and those with persistent infection.*

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*Corresponding author:*

L. Thanos, Department of Computed Tomography, "Sotiria" General Hospital of Chest Diseases, 152 Mesogeion Ave., GR-115 27 Athens, Greece  
e-mail: loutharad@yahoo.com