

# Cervical spondylodiscitis mimicking Pott's disease: a case report

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**Abstract.** – **INTRODUCTION:** The leading cause of pyogenic vertebral osteomyelitis is *Staphylococcus aureus*, and its incidence is rising, particularly in the elderly. We report an unusual case of cervical spondylodiscitis and epidural abscess mimicking Pott's disease.

**CASE REPORT:** A 67-year-old man was admitted to our institution with a 15-day history of neck pain radiating to the head, shoulders and left arm that was associated with weakness and paresthesia. Laboratory tests showed a mild leucocytosis and high levels of inflammatory markers. The MRI showed contrast enhancement of C6-C7 with an abscess infiltration extending to the intervertebral disc, the anterior epidural space, and the medullary cord. The patient had a medical history of a positive Mantoux tuberculin skin test 25 years prior, and the interferon-gamma release assay (IGRA) was positive for the identification of latent tuberculosis infection. All other examinations for diagnosis of spinal tuberculosis were inconclusive. Intravenous antibiotic therapy was initiated with teicoplanin 800 mg and levofloxacin 750 mg daily with a fast recovery of symptoms.

**CONCLUSIONS:** Cervical spondylodiscitis can be an unusual cause of severe neck pain with a challenging differential diagnosis. Conservative treatment should always be considered for patients without neurological symptoms as long as close follow-up evaluations are performed.

## Key Words

Cervical spondylodiscitis, Spinal tuberculosis, Epidural abscess, Neck pain.

Timely diagnosis is critical because discitis and epidural abscesses in the cervical region have been shown to have a mortality ranging from 2% to 19%<sup>4,5</sup>. A missed or delayed diagnosis may cause severe local effects including spinal cord compression due to the smaller diameter of the cervical spinal canal compared with the thoracic and lumbar regions and due to systemic effects related to bacteraemia and disseminated infection.

The leading cause of pyogenic vertebral osteomyelitis is *Staphylococcus aureus*, and its incidence is rising, particularly in the elderly<sup>5-7</sup>. Haematogenous seeding of infection is still by far the most common mechanism of spinal infection<sup>8,9</sup>. Classically, lesions in two adjacent vertebral bodies are a consequence of the segmental nature of the supplying arteries that bifurcate to the vertebral bodies with a lower blood flow that supplies the disc. Although less often than by the arterial route, also the venous circulation may play a role in the pathogenesis of spondylodiscitis<sup>10</sup>. Disc infection usually arises via direct spread from the vertebral body after the endplate has been destroyed<sup>11,12</sup>.

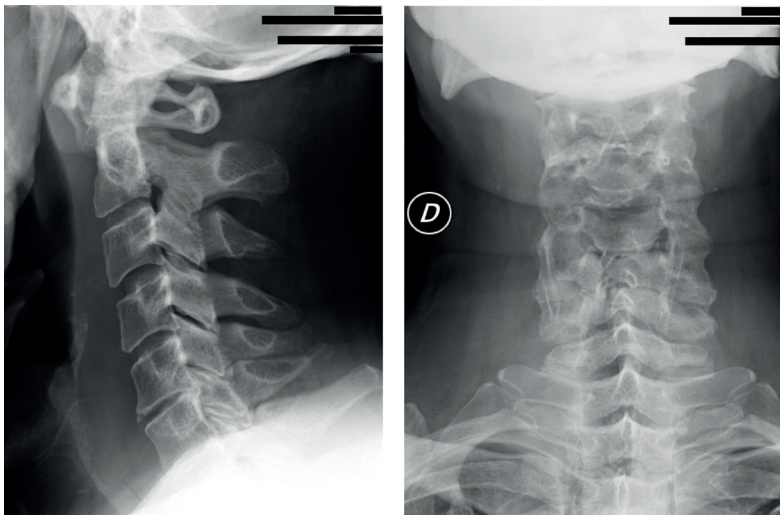
We report an unusual case of cervical spondylodiscitis and epidural abscess mimicking Pott's disease.

## Case report

A 67-year-old man was admitted to our institution with a 15-day history of neck pain radiating to the head, shoulders and left arm that was associated with weakness and paresthesia. The medical history included a BMI of 27.7, gastritis, hypertension, benign prostatic hypertrophy, steatohepatitis, low-energy trauma to the cervical spine one year prior, and a positive Mantoux tuberculin skin test 25 years prior. He was treated with omeprazole, losartan, tamsulosin and dutasteride. On admission, the patient was awake, alert, and oriented.

## Introduction

Infectious spondylodiscitis is an infectious process involving two vertebral bodies and the corresponding intervertebral disc. The incidence of this disease ranges from 0.4 to 2.4 per 100,000 patients per year and increases with the age of the patients<sup>1</sup>. These numbers are expected to increase because of the higher number of immunocompromised patients, the earlier and more frequent use of intravenous access devices, and the increasing prevalence of genitourinary surgery in the elderly<sup>2,3</sup>.



**Figure 1.** The plain radiograph showed straightening of cervical spine, narrowing of C5-C6 and C6-C7 disc spaces without destruction or collapse of vertebral bodies.

On physical examination, the patient was not limping. The osteotendinous reflexes in the left upper limb showed tricipital areflexia, bicipital and stylo-radial normoreflexia; the osteotendinous reflexes in the other limbs were normal. Pain upon the digital pressure at C6 was noted. The Roger-Bikelas-De Seze manoeuvre was negative. Flexion of the cervical spine was possible up to 20° when the patient experienced sharp pain, but the extension was impossible. Rotational movements were not affected, but lateral inclinations were limited. The patient's vital signs were stable, and he had no fever.

A radiographic examination and an MRI of the cervical spine were performed (Figures 1 and 2).

Haematological examination showed a mild leucocytosis of 16140/uL (reference range - r.r: 5200-12400) with 10150/uL neutrophils (r.r. 1900-8000), a haemoglobin level of 13,4 g/dL (r.r: 14-18),

a platelet count of 473 x 10<sup>3</sup>/uL (r.r: 130-400), a fibrinogen of 594 mg/dL (r.r: 200-400), a total bilirubin of 1,18 mg/dL (r.r: < 1,1), a direct bilirubin of 0,48 mg/dL (r.r: < 0,3), an alanine aminotransferase of 73 UI/L (r.r: < 41), an alkaline phosphatase of 186 UI/L (r.r: 40-129) and a gamma-glutamyl-transferase of 248 UI/L (r.r: 8-61). High C-reactive protein (CRP) levels were found (103 mg/L; r.r: 0-5). The interferon-gamma (IFN- $\gamma$ ) release assay (IGRA) for identification of latent tuberculosis infection was positive. A blood culture, Wright's serum agglutination test and anti-*Brucella* IgG and IgM antibodies were negative. Evaluation for alcohol-resistant bacilli and PCR and culture of urine and sputum for *Mycobacterium tuberculosis* were inconclusive. Chest X-rays, a computed tomography scan of the chest with and without contrast, echocardiography and abdominal ultrasonography failed to find signs of tuberculosis. A CT-guided



**Figure 2.** The sagittal MRI T1-weighted sequences of the cervical spine showed abnormal marrow infiltrations in C5, C6 and C7. The signal is highly hyperintense on the STIR-weighted sequences (A). Intense gadolinium enhancement was observed from C5 to C7 with an abscess infiltration extending to the intervertebral disc, the anterior epidural space and the medullary cord (B). Narrowing of the spinal canal was observed on axial T1-weighted images (C).

**Table I.** Levels of blood inflammatory markers of infection.

	C-reactive protein r.r. 0-5 mg/L	ESR r.r. <30 mm/h	Fibrinogen r.r. 200-400 mg/dL	Leukocytes r.r. 5200-12400/uL
Clinical presentation	103.0	45	594	16140
After 1 week of AB	14.0	25	502	6550
After 4 weeks of AB	11.1	22	473	7710
After 6 weeks of AB	6.2	11	365	5450
1 month after AB conclusion	< 3.16	2	247	5450
1 year after AB conclusion	< 3.02	4	251	10220

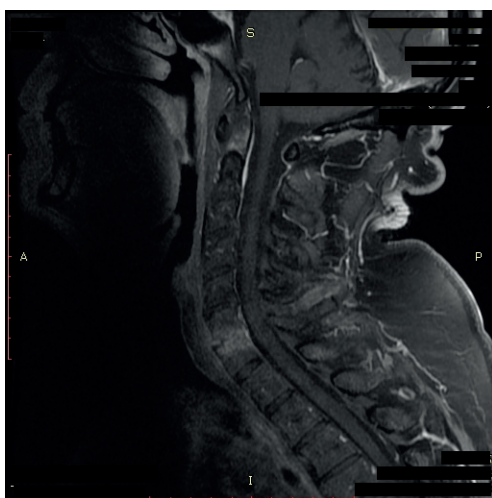
AB indicates antibiotics; r.r., reference range.

needle biopsy and the following microbiological analysis of tissue sample failed to isolate the pathogen for proper antibiotic choice<sup>13</sup>.

In light of these findings, pyogenic spondylodiscitis was suspected, and intravenous antibiotic therapy was initiated with 800 mg of teicoplanin and 750 mg of levofloxacin daily. A semi-rigid cervical collar was also prescribed.

A rapid relief of symptoms and a reduction in inflammatory markers following antibiotic therapy was immediately noted. Intravenous antibiotic therapy was administered for four weeks followed by an additional two weeks of daily administration of 400 mg of intramuscular teicoplanin and 500 mg of oral levofloxacin. Ten weeks after admission to the hospital, the inflammatory markers definitively normalized (Table I).

A contrast-enhanced MRI performed 8 weeks after the conclusion of antibiotic therapy showed slight contrast enhancement of C6-C7 without any cord compression on sagittal and axial images (Figure 3).

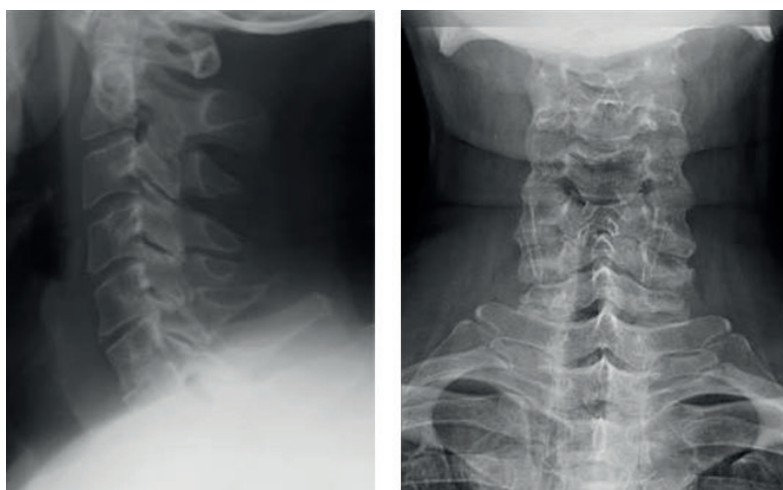


**Figure 3.** T1-weighted sagittal MRI 8 weeks after the suspension of antibiotic therapy showed a *slightly contrast enhancement* of C5-C6 without any cord compression.

A follow-up clinical examination one year later showed complete recovery of the neurological symptoms and no recurrence of the disease. The X-ray examination showed C6-C7 intersomatic fusion with no destruction of the vertebral bodies and normal sagittal spine alignment one year after the onset of symptoms (Figure 4).

## Discussion

We describe an unusual case of cervical spondylodiscitis and epidural abscess mimicking Pott's disease. Two distinctive characteristics of the present case are worth addressing. First, a differential diagnosis that includes spinal tuberculosis, brucellar spondylitis, sarcoidosis, metastasis, multiple myeloma, and lymphoma must be considered. In addition, a misleading differential diagnosis of cervical tuberculosis must also be considered in this patient. Spinal tuberculosis is an extrapulmonary form of the disease in which the primary infection site is either a pulmonary lesion or an infection of the genitourinary system. The destruction of the disc space and the adjacent vertebral bodies and the severe and progressive kyphosis is known as Pott's disease. Approximately 10% of patients with extrapulmonary tuberculosis have skeletal involvement. Spinal tuberculosis accounts for approximately 50% of cases of skeletal tuberculosis, but the cervical location is uncommon and is found in approximately 4% of spinal tuberculosis cases<sup>14,15</sup>. The tentative diagnosis of Pott's disease is based on clinical suspicion (history of tuberculosis), a positive tuberculin skin test (Mantoux test), acid-fast bacillus testing, positive polymerase chain reaction (PCR) for *M. tuberculosis* or positive IGRA test. Microbiological evaluation of respiratory specimens, as well as bone tissue or abscess samples, cultured and stained for acid-fast bacilli are



**Figure 4.** The plain radiograph of the cervical spine at 1-year follow-up showed C6-C7 intersomatic fusion and preservation of the vertebral bodies height.

required to confirm the diagnosis. In this case, the Mantoux and IGRA tests suggested a diagnosis of latent tuberculosis infection; however, this possibility was excluded by further examinations. The evidence suggests that tuberculin skin testing using the Mantoux technique and the IGRA test are acceptable but imperfect tests. These tests represent indirect markers of *Mycobacterium tuberculosis* exposure and indicate a cellular immune response to *M. tuberculosis*. Neither test can accurately differentiate between latent and active tuberculosis, distinguish reactivation from reinfection, or resolve the various stages within the spectrum of *M. tuberculosis* infection.

Other issues to be considered for the differential diagnosis of Pott's disease include blood tests and radiographic examination. In pyogenic infection, leucocytosis parallels an increased ESR, while in patients with spinal tuberculosis, there is a markedly elevated ESR but a normal white blood cell count. MRI does not allow the differentiation of pyogenic spondylitis from tuberculous spondylitis. However, imaging of vertebral tuberculosis includes extensive paraspinal soft tissue shadows, well-defined abnormal paraspinal signal, subligamentous spread, and the presence of spinal deformities. Intervertebral disc destruction and strong gadolinium enhancement on T1-weighted images are very frequent in pyogenic spondylitis<sup>16-18</sup>.

Microbiological culture is a cornerstone for the diagnosis and treatment of spondylodiscitis, and the lack of a microbiological culture for the case reported represents a methodological flaw of treatment strategy and a negative prognostic factor<sup>19</sup>. However, patients without a microbiological diag-

nosis can receive empiric broad-spectrum antibiotic therapy with closer monitoring<sup>19</sup>. In this case, the second major issue was the choice of treatment from the various options available. Guidance for the management of cervical spondylodiscitis in the absence of neurologic deficits is limited<sup>20</sup>, and the choice of conservative or surgical management remains controversial<sup>21</sup>. Generally, conservative treatment can be reserved for selected patients who do not have neurological symptoms<sup>22</sup>, provided that they undergo close follow-up evaluations, including neurological examinations, MRI studies, and laboratory examinations. Patients who have neurological involvement need immediate surgical treatment. In this context, early and aggressive surgical management has not been shown to impact survival or rates of neurological recovery clearly; therefore, surgical management was not performed in this case. In light of the difficulty in predicting clinical responsiveness to antibiotics<sup>23</sup>, the rapid relief of the patient's symptoms supported the choice of treatment.

## Conclusions

This case draws attention to cervical spondylodiscitis as an unusual cause of severe neck pain. A detailed assessment, including the patient history, laboratory and imaging examinations, is necessary to gather the information relevant to the condition to develop an accurate differential diagnosis. Conservative treatment should always be considered for patients without neurological symptoms as long as close follow-up evaluations are performed.

### Conflict of Interests

The authors declare that they have no conflicts of interest.

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