

# Spondylodiscitis: a rare differential diagnosis of abdominal pain

## *Espondilodiscite: um diagnóstico diferencial raro de dor abdominal*

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### ABSTRACT

Spondylodiscitis is an inflammatory process, often of infectious origin, that attacks the intervertebral disks and related vertebra. Diagnosis may be very difficult because it is a rare disease of insidious symptoms and also because of the high incidence of backache in the general. This report describes the case of a patient admitted to the Gastroenterology service with a complaint of abdominal and lumbar pain followed by progressive weight loss. Propaedeutics used had fundamental importance in the diagnosis and elimination of other causes. Conservative treatment was enough to achieve patient recovery.

**Key words:** Abdominal Pain; Low Back Pain; Spondylitis; Osteomyelitis; Discitis.

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### RESUMO

*Espondilodiscite é um processo inflamatório, geralmente infeccioso, que acomete os discos intervertebrais e as vértebras associadas. O diagnóstico pode ser bastante difícil, devido à raridade da doença, à sintomatologia insidiosa e à alta prevalência de dor lombar na população geral. Este relato descreve o caso de paciente admitido em serviço de Gastroenterologia com dor abdominal e lombar, acompanhada de emagrecimento progressivo. A propedêutica realizada foi fundamental para o diagnóstico e a exclusão de outras causas. O tratamento conservador foi suficiente para a completa recuperação do paciente.*

*Palavras-chave:* Dor Abdominal; Dor Lombar; Espondilite; Osteomielite; Discite.

### INTRODUCTION

Spondylodiscitis is the main manifestation of osteomyelitis in patients older than 50 years<sup>1</sup> and is related to complications such as severe pain and persisting neurological deficits<sup>2</sup>. It can occur by hematogenous dissemination, percutaneous inoculation or by contiguity<sup>3</sup>. *Staphylococcus aureus* and enterobacteria are responsible for more than half of the cases not related to tuberculosis.<sup>2,4,5</sup> Diagnosing it can be very difficult due to the rarity of the disease, the insidious symptoms, and the high prevalence of low back pain in the general population.<sup>3</sup> In some cases, the abdominal pain receives more attention than the low back pain, which can result in diagnostic delays in the absence of a high degree of suspicion. Magnetic resonance imaging (MRI) is the imaging test that best evaluates changes in the intervertebral disc, vertebrae and adjacent soft tissue<sup>6</sup>. Treatment is initially conservative, with non-pharmacological measures<sup>7</sup> and culture-guided antibiotic therapy whenever possible<sup>8</sup>. The surgical approach is indicated in cases of spinal compression, spinal instability, severe kyphosis and upon failure of the conservative<sup>1,7</sup>.

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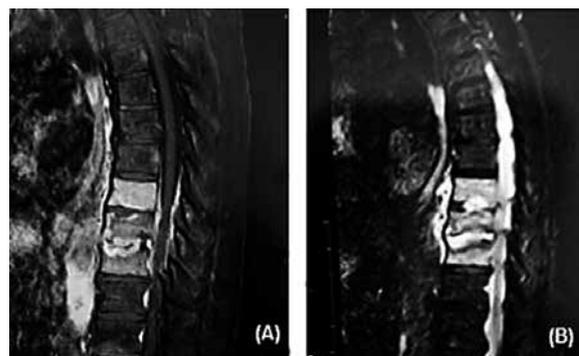
## CASE REPORT

A 76-year old man was admitted to the Gastroenterology Ward at the Hospital do Instituto de Previdência dos Servidores do Estado de Minas Gerais (IPSEMG) with strong, diffuse, stinging abdominal pain, in addition to back pain, which got worse when walking. This situation was ongoing for a month and he lost 18 kg during this period. He was alert, oriented, emaciated, and hydrated, with systemic blood pressure of 160/80 mmHg, heart rate of 85 bpm in sinus eupneic rhythm, unaltered pulmonary auscultation, and his abdomen was distended, hypertympanic, diffusely painful on superficial and deep palpation, with no masses or visceromegaly. The patient reported a previous diagnosis of major depression, hypertension, type 2 diabetes mellitus and bronchial asthma as well as a history of repeated respiratory infections. He made home use of Losartan, acetylsalicylic acid, insulin, and venlafaxine. He was admitted to the same hospital two months earlier due to bronchospasm and abdominal pain; the hypothesis of surgical abdomen was ruled out. An ultrasound of the abdomen requested during this hospitalization showed a mild hepatic steatosis, a small stone on the right kidney, and aortic atheromatous plaques.

Laboratory tests upon admission revealed normal blood panel, leukocyte count, ionogram, coagulation, renal and liver function, elevated C-reactive protein (CRP= 128.4 mg/dL), and normal routine urine, chest X-ray no signs of consolidation, with the profile showing a slight reduction of the intervertebral spaces between T8 and T9, and T9 and T10. There were signs suggesting semi-obstruction of bowels during initial observation, progressing to sepsis, fever, and worsening of general condition without hemodynamic instability. Blood cultures were collected and empirical antibiotic therapy with cefepime commenced while waiting for the results.

The requested blood cultures were positive for *Klebsiella pneumoniae* and the antibiotic was replaced with ciprofloxacin, based on susceptibility testing. Upper gastrointestinal endoscopy showed a prepyloric ulcer (A1 Sakita), with *H. pylori* infection, which was eradicated during hospitalization. A colonoscopy was also performed after improvement of the patient's clinical status. It showed diverticular ostia in the sigmoid and descending colon, plus two polyps in the transverse colon, whose biopsy showed them to be tubular adenomas. Due to suspected pancreatic neoplasia, an MRI of the abdomen was requested with cholangiopancreatography (MRCP), which re-

vealed no pancreatic disorders but showed T1 signal hypointensity and T2 hyperintensity in intervertebral spaces T8 to T9 and T9 to T10; these were compatible with spondylodiscitis, in addition to affected adjacent vertebral bodies and edema of surrounding tissues, without abscesses (Figure 1).



**Figure 1** - Sagittal sections of hypos-signal MRI showing vertebral bodies on T1 (A) and hyperintense on T2 (B) in the T8-T9 and T9-T10 segments.

The patient was kept in bed rest and conservative treatment with parenteral antibiotics. The case progressed with improvement of the lumbar pain, appetite, and general condition. CRP fell to 18.7 mg/dL after three weeks of treatment. He was discharged with oral ciprofloxacin prescribed for three more weeks, and scheduled to return to outpatient clinic for follow-up and radiological control. After six weeks' treatment, he was in good general condition, reporting no abdominal pain or low back pain, walking without difficulty and with normal CRP, upon which the antibiotic therapy was suspended.

## DISCUSSION

Spondylodiscitis is an inflammatory, often of infectious process that attacks the intervertebral disks and related vertebra. Although rare, it is the main manifestation of hematogenous osteomyelitis in patients over 50 years of age and represents 3-5% of osteomyelitis cases<sup>1</sup>. It presents bimodal distribution among age groups, with a peak before the age of 20 and another between 50 and 70. Men are more affected, with a male/female ratio of 1.5 -2:1. Mortality occurs in less than 5% of patients and is mainly related to early sepsis<sup>2</sup>. Its main complications are permanent neurological deficits and severe pain, which happens in about one third of cases.<sup>2</sup>

Vertebral infection can occur by three routes: hematogenous dissemination, direct percutaneous inoculation or dissemination of an infected focus by contiguity<sup>3</sup>. The hematogenous arterial route is the main one, affecting mainly the lumbar spine, followed by the thoracic and cervical routes (58, 30 and 11%, respectively<sup>9</sup>). Direct inoculation is most commonly caused by iatrogenesis in spinal surgical procedures or lumbar puncture, representing 25-30% of cases of spondylodiscitis<sup>4</sup>. As for infection by contiguity, it is far more rare and may be related to aortic prosthetic infection, esophageal rupture or retropharyngeal abscess<sup>3</sup>.

Focal infections can be identified from a distance in approximately 50% of spondylodiscitis cases<sup>9</sup>, especially in: genitourinary tract (17%), infective endocarditis (12%), skin and soft tissues (11%), endovascular prostheses (5%), gastrointestinal tract (5%), respiratory tract (2%) and oral cavity (2%)<sup>9</sup>. Diabetes mellitus is the most commonly identified risk factor, but others have been found, such as advanced age, use of injection drugs, immunosuppression, malignancy, renal insufficiency, rheumatic diseases, cirrhosis, and previous spinal cord surgery.<sup>3</sup>

Spondylodiscitis by bacterial infection is the second leading cause of vertebral infection in the world, preceded only by tuberculosis<sup>4,5</sup>. *Staphylococcus aureus* is found in almost half of all cases, especially in patients over 50 years of age, with no obvious source of infection and no history of recent hospitalization<sup>2,4,5</sup>. *Escherichia coli*, *Proteus*, *Klebsiella* and *Enterobacter spp* are associated with urinary tract infection and advanced age<sup>2,4,5</sup>, and *Streptococcus viridans* and Group A and B beta-hemolytics with infective endocarditis<sup>2,4</sup>. *Streptococcus pneumoniae* is an extremely rare cause, as well as *Pseudomonas aeruginosa*, coagulase-negative staphylococci, anaerobes, fungi and parasites. Polymicrobial infection is very uncommon, accounting for less than 10% of cases<sup>2,4,5</sup>.

The diagnosis is based on clinical, laboratory, and imaging findings. Disease manifestations begin insidiously, with constant low back pain or cervical pain, which worsens at night and may radiate to the chest or abdomen<sup>3</sup>. Hypersensitivity in the spine region associated with restricted movement and spasm of paravertebral muscles is the most common symptom, found in 78-97% of cases<sup>3,10</sup>. Fever can be detected in half of all cases, and the neurological deficits, which include weakness in the legs, paralysis, sensory deficit, radiculopathy and fecal incontinence, affect one

third of patients<sup>9</sup>. It can be more acute in children, and the symptoms include irritability, difficulty to walk or crawl, hip or abdominal pain<sup>3</sup>.

Laboratory alterations, as well as the clinical manifestations, are nonspecific. Leukocytosis is found in only one third of cases<sup>10</sup>. PCR increase and erythrocyte sedimentation rate (ESR), on the other hand, are common and useful for assessing response to treatment. A 25% fall in the initial ESR value after a month of treatment with antibiotics relates to a good prognosis<sup>3</sup>.

A simple x-ray of the spine has 82% sensitivity, 57% specificity and 73% accuracy for the diagnosis of spondylodiscitis<sup>6</sup>, and can show in its inception reduction of the intervertebral space and loss of definition of the spinal pillars<sup>11</sup>. Later changes, such as destruction of vertebral bodies, fractures and collapse of vertebrae suggest sequelae<sup>11</sup>. Computed tomography (CT) can identify earlier changes<sup>6</sup>; however, it is inferior to MRI for assessing the spinal cord, neighboring soft tissues and potential abscesses. Sensitivity, specificity and accuracy of MRI in diagnosing spondylodiscitis reach 96, 93 and 94%, respectively<sup>6</sup>. The characteristic alterations found in this examination consist of reduction in the intensity of the signal disk and in the adjacent vertebral bodies in T1 and increase in the intensity of the signal of these areas in T2<sup>3,6</sup>.

The goal of the treatment is to eradicate the infection, relieve pain, and restore or preserve the spinal chord's function and structures. Conservative treatment consists of non-pharmacological measures, such as physical therapy and immobilization, and use of antibiotics<sup>3</sup>. Immobilization is indicated in cases of major pain or risk of spinal instability<sup>7</sup>. Antibiotic therapy can only take place after the result of blood culture or biopsy of the lesion, unless there is a risk of severe sepsis, when empirical antibiotic therapy should be started until the antibiogram is obtained<sup>8</sup>. Antibiotics with good coverage for *S. aureus* and Gram-negative bacteria, in addition to good penetration into the intervertebral disc, include cephalosporins, quinolones, clindamycin and aminoglycosides. The route of administration and duration of treatment are not yet well defined. Usually, the initial route of choice is parenteral, which can be replaced, if possible, to oral after 10 days<sup>3</sup>. The average length of treatment ranges from six to 12 weeks<sup>3,4</sup>. The surgical approach is indicated for cases of spinal compression, spinal instability, severe kyphosis, and failure

of conservative treatment<sup>1,7</sup>. Radiologically guided percutaneous drainage of epidural abscesses can be an effective alternative to surgery, and it can be indicated even in the absence of neurological deficits<sup>12</sup>. The criteria for cure of infection include disappearance or improvement of symptoms and normalization of the ESR or CPR<sup>2,4</sup>.

This case report presents a patient admitted in the gastroenterology ward with significant abdominal pain and back pain of approximately one month in duration. It progressed with lack of appetite, weight loss, and limited mobility. The exclusion of abdominal diseases, primarily neoplastic, was possible through the workup. The MRI was essential for diagnosing spondylodiscitis as it revealed the typical changes in the lesions of the disc and adjacent vertebrae. Identifying the bacteria in the blood culture allowed for the specific antimicrobial treatment to be pursued, and surgical procedures were not needed. The treatment lasted six weeks and succeeded in eliminating the symptoms and normalizing the CPR.

Because it is rare, a high degree of suspicion and the availability of imaging technologies such as MRI are needed for the diagnosis of spondylodiscitis and are essential to allow early treatment and to reduce complications.

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