Espondilodiscitis multifocal y meningoencefalitis por Staphylococcus aureus en un paciente inmunocomprometido

Multifocal spondylodiscitis and meningoencephalitis due to Staphylococcus aureus in an immunocompromised patient

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ABSTRACT

Spondylodiscitis is a rare diagnosis, but its incidence has increased in recent years. It represents 3-5% of osteomyelitis, and the multifocal affliction is rare as it occurs in 4-8% of all spondylodiscitis. The occurrence of meningoencephalitis associated with spondylodiscitis is also a rare association.

We present the case of a 54-year-old woman diagnosed with multifocal spondylodiscitis complicated with meningoencephalitis and intracanal and paravertebral abscess with identification in blood cultures of Staphylococcus aureus. Immunosuppression with infliximab was identified as a risk factor.

The patient underwent targeted antibiotic therapy, opting for the conservative strategy due to the surgical risk. There was a positive evolution with imaging resolution of the intracanal abscess.

This case is of particular importance due to its rarity of frequency and considering the etiological agent and the low frequency of this infection in patients under anti-TNF-alpha therapy.

Keywords: Discitis, Meningoencephalitis, Staphylococcus aureus, Biological therapy.

RESUMEN

La espondilodiscitis es un diagnóstico poco frecuente, pero su incidencia ha aumentado en los últimos años. Representa el 3-5% de las osteomielitis, y la afección multifocal es rara, ya que se da en el 4-8% de todas las espondilodiscitis. La aparición de meningoencefalitis asociada a espondilodiscitis también es una asociación poco frecuente.

Presentamos el caso de una mujer de 54 años diagnosticada de espondilodiscitis multifocal complicada con meningoencefalitis y absceso intracanal y paravertebral con identificación en hemocultivos de Staphylococcus aureus. Se identificó como factor de riesgo la inmunosupresión con infliximab.

La paciente fue sometida a antibioterapia dirigida, optándose por la estrategia conservadora debido al riesgo quirúrgico. Hubo una evolución positiva con resolución imagenológica del absceso intracanal.

Este caso es de especial importancia por su escasa frecuencia y teniendo en cuenta el agente etiológico y la baja frecuencia de esta infección en pacientes bajo terapia anti-TNF-alfa.

Palabras clave: Discitis, Meningoencefalitis, Staphylococcus aureus, terapia biológica.

BACKGROUND

Vertebral osteomyelitis, often called spondylodiscitis, corresponds to an infection with low incidence (0.2-2.4 cases per 100,000 people per year), but its incidence has risen due to improvement in accuracy of imaging diagnostic tests and a growing vulnerable population.[1–3]

Multifocal involvement is rare and often associated with granulomatous agents[3,4]. The association of meningoencephalitis and spondylodiscitis is also rare, reported in only 0.5% of cases.[5]

Immunosuppressive therapy appears as a risk factor for the occurrence of spondylodiscitis, however only a small number of cases reported for this infection are related to biological therapies such as anti-TNF-alpha drugs.[3,6]

CASE PRESENTATION

We present the case of a 54-year-old woman, diagnosed with Crohn's disease 6 years before, treated with infliximab for the last 4 years, with good control of the disease and no complications. Clinical history also included depressive syndrome, inflammatory facial acne and active smoking habits. Before the beginning of biological therapy, she was treated for latent tuberculosis with isoniazid for 9 months.

The patient was in her usual state of health up to 1 month before admission, when she starts to feel unwell non-specifically, complaining of lower back pain with mechanical rhythm and myalgias. She went to the emergency room due to somnolence, hetero aggressiveness and incoherent speech. Other symptoms were denied including fever, nocturnal sweating, weight loss, change in bowel pattern, diarrheal stools, abdominal pain or new skin lesions.

On observation, she was somnolent with incoherent but understandable speech, able to follow orders. She was febrile and hemodynamically stable. She had limited flexion of the upper limbs due to pain, no other neurological deficits, no stiff neck, and no other abnormalities on physical examination.

Analytically, we highlight the increase in inflammatory parameters and no other relevant alterations (Table 1). Lumbar punction was compatible with meningitis. Cranial CT showed no alterations.

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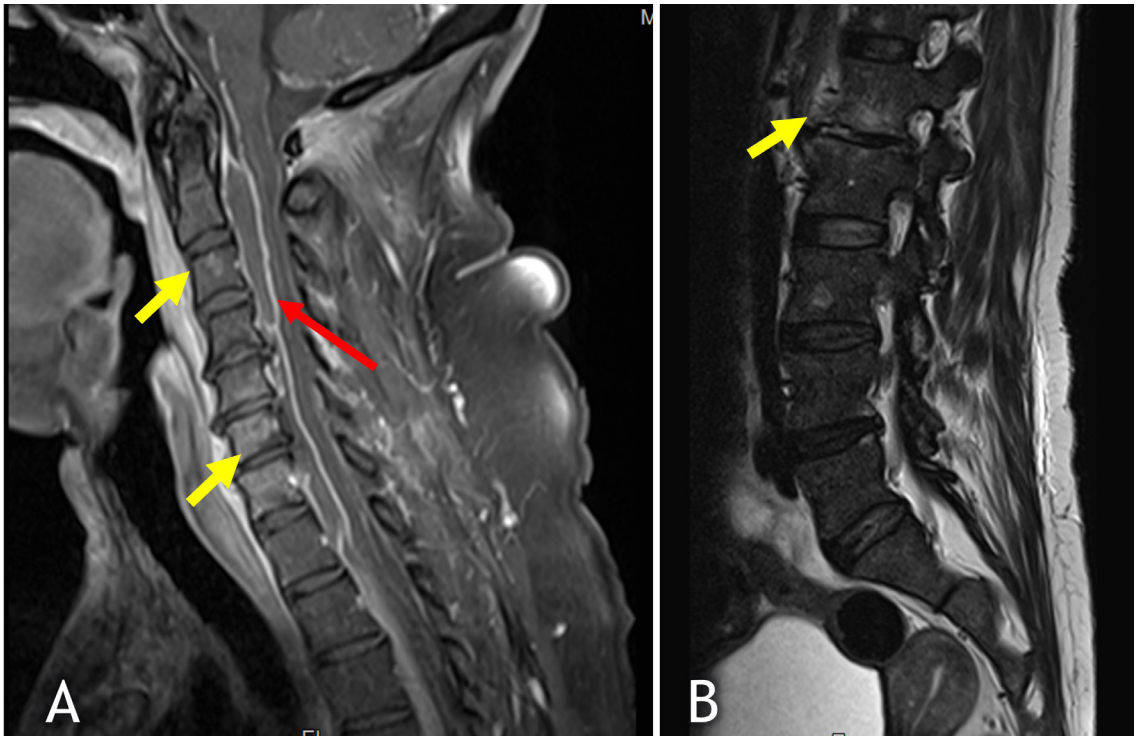

Figure 1. A – RM image (T1-weight) from cervical spine with evidence of spondylodiscitis (yellow arrows) and intracanalar abscess (red arrow). B – RM image (T2-weight) from lumbar spine with evidence of spondylodiscitis (yellow arrow).

The adenosine deaminase was within normal range and the bacteriological and mycobacteriological examination of the cerebrospinal fluid (CSF) were negative, as well as the *Mycobacterium* tuberculosis DNA.

Blood cultures collected on admission isolated methicillin-sensitive *Staphylococcus aureus*.

Magnetic resonance imaging (MRI) of the skull and the entire spine completed the study showing multiple foci of non-contiguous multifocal spondylodiscitis: spondylodiscitis of C1-C2, C4-D2, L1-L2, associated with cervical intraraquidian abscess located in anterior epidural space which compresses the medulla, and multiple pre and para vertebral abscesses at cervical and lumbar localization (Figure 1).

Initially, after CSF changes compatible with meningoencephalitis she went on broad-spectrum antibiotics, which was adjusted according to a sensitivity test for flucloxacillin 2g every 6 hours and associated with rifampicin 600mg/day. There was complete and quick regression of the behaviour abnormalities. New blood cultures were negative. Echocardiogram was performed to exclude endocarditis.

The case was discussed with Neurosurgery, but a conservative strategy was decided, given the surgical complexity and the possibility of permanent neurological damage. The decision was to maintain intravenous antibiotics for 8 weeks considering the presence of non-drained intrarraquidian abscess. MRI reevaluation showed reduction in size of the abscess and continuation of oral flucloxacillin was maintained until it's resolution (total of 12 weeks of antibiotics). She used a neck brace to ensure cervical immobilization and went into physiotherapy program with a favourable clinical course.

DISCUSSION

Spondylodiscitis remains an uncommon diagnosis, corresponding to 3 to 5% of osteomyelitis. It's more frequent in patients over 50 years, with a higher incidence in men. Risk factors include *diabetes mellitus*, immunosuppression, history of infections, injecting drug use, human immunodeficiency virus infection, cardiovascular disease, obesity, renal failure, chronic hepatitis, rheumatic diseases, cancer, tuberculosis in the past, previous abdominal surgery, and sickle cell disease. A retrospective study of multifocal spondylodiscitis identified two patients with rheumatoid arthritis who were under anti-TNF-alpha drugs (namely adalimumab and etanercept).[6,7]

Pyogenic spondylodiscitis most frequently affects the lumbar spine followed by thoracic and cervical, with multifocal involvement occurring only in 4-8% of cases[2,4,8]. Cervical involvement is found to be associated with the presence of epidural abscess more frequently as well as neurological deficits when compared with the other segments of the spine.[2]

The association of meningitis and spondylodiscitis is rare, reported only in 0.5% of cases, and it can result of hematogenous or contiguous spreading of the infection.[5]

The clinical manifestation of spondylodiscitis is often nonspecific (presence of lower back pain, fatigue and fever) making imaging exams essential for diagnosis. Neurological deficits can occur in 33-79% of cases. MRI is currently the gold standard due to the high sensitivity and specificity. CT has lower sensitivity and specificity although it can identify changes in 94% of patients, but soft tissue assessment is limited with this technique. PET 18 F-fluorodeoxyglucose is an alternative exam if MRI cannot be used.[2,3]

PARAMETER (UNITS)	NORMAL RANGE	RESULTS
Blood analysis		
Haemoglobin (g/L)	115-160	119
Leucocytes (x109/L)	4.00-10.00	17.96
PCR (mg/dL)	<0.50	12.22
Creatinine (mg/dL)	0.7-1.30	0.45
Urea (mg/dL)	19-49	14
Alanine transaminase (UI/L)	<34	12
Aspartate transaminase (UI/L)	<49	65
Alkaline phosphatase (UI/L)	46-116	112
CRF analysis		
Proteins (mg/dL)	15-45	582
Glucose (mg/dL)	40-70	27
Cells (leucocytes/uL)	<5	80
		Predominance of mononuclear cells

Table 1. Analytics parameters, on admission

The identification of the etiological agent is crucial for therapeutic guidance. Overall identification of agents is possible in 49-83% of cases. The most frequent agent associated with multifocal spondylodiscitis is *Mycobacterium tuberculosis*, *Brucella* and fungal species. Agent identification in blood cultures occurs in 25-70% of cases; CT-guided fine-needle material collection allows for agent identification between 19-50%; Surgical biopsy allows the detection in 68-93% of cases.[9,10]

The latest guidelines for treatment of spondylodiscitis suggest delaying the start of antibiotic therapy until the responsible agent is identified unless hemodynamic instability or neurological degradation arises. The duration of the antibiotic course as well as the duration of intravenous antibiotic therapy remains under discussion with some authors demonstrating shorter courses (6 weeks) as not inferior to the longer duration (12 weeks)[1,2,7,9]. The addition of rifampicin is of benefit in bone infections.[3]

CONCLUSION

The presented case is important since it presents a case of multifocal spondylodiscitis associated to meningoencephalitis to *Staphylococcus aureus*. As a risk factor she was on immunosuppressive treatment with infliximab, which is a complication only identified in occasional cases.

MRI was essential for the diagnosis, allowing the identification of several non-contiguous foci of infection as well as the presence of intracanal abscess and paravertebral phlegmon. The surgical procedure was high-risk, and a conservative strategy was adopted.

Despite the complications identified namely meningitis and presence of an intracanal abscess there was a favourable evolution with antibiotics.

CONFLICT OF INTEREST
The authors declare that they have no conflict of interests.

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ETHICAL ASPECTS
All participants submitted a consent form to be included in this study.

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