



Original Research Article

Infectious spondylodiscitis – A case series analysis

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ABSTRACT

Purpose: We aimed to describe the clinical and laboratory features as well as diagnostic difficulties in the case series of spondylodiscitis.

Materials/methods: We retrospectively reviewed 11 cases of spondylodiscitis. The diagnosis of spondylodiscitis was based on clinical, radiological and microbiological evidence and by the response to antimicrobial therapy.

Results: There were 7 men and 4 women, and the age ranged from 21 to 74 years. Risk factors of spondylodiscitis were observed in 7 patients. The approximate time from onset of symptoms to diagnosis was from 2 to 7 months (median 45 days). Back pain was the most common symptom. The most frequent location of spondylodiscitis was lumbar spine. Pathogens were isolated in 6 cases and were as follows: *Staphylococcus aureus* (4 cases), *Staphylococcus warneri* (1 case) and *Escherichia coli* (1 case). After therapy, all patients had rapid regression of symptoms and no permanent neurological impairments and recurrence of infection were observed.

Conclusions: Diagnosis of spondylodiscitis is frequently delayed. This disease should be taken into consideration in differential diagnosis in patients with root syndromes accompanied by back pain and usually fever as well as increased values of CRP and ESR.

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1. Introduction

Spondylodiscitis is quite a rare disease characterized by insidious onset and non-specific symptoms such as back pain and fever. Consequently, early diagnosis is difficult and is often missed despite repeated warnings in the medical journals and better access to imaging techniques such as magnetic resonance imaging (MRI) and computed tomography (CT). The term *spondylodiscitis* includes *vertebral osteomyelitis* and *discitis*. The term vertebral osteomyelitis means inflammation of the vertebral body and the term discitis indicates infection of the intervertebral disk space. Spondylodiscitis may take acute, subacute or chronic course [1–3].

The incidence of spondylodiscitis is about 2.4 cases per 100,000 annually, and it increases with age. The disease is diagnosed in males more often than in females [2,4]. Aging, multi-morbidity, changes in

lifestyle leading to spinal injury, drug abuse, and increasing number of patients with immunological deficits are important factors contributing to gradual increase of spondylodiscitis incidence [1,3,5,6].

2. Material and methods

The medical documentation of 11 patients with spondylodiscitis hospitalized at the Department of Infectious Diseases and Neuroinfections of Medical University in Białystok (Poland), between March 2002 and December 2011 was reviewed. Before admission to our Department the majority of patients were treated at the Department of Neurosurgery. The parameters analyzed were as follows: demographic pattern, risk factors, clinical symptoms, localization of the infection, blood tests, bacterial cultures, MRI findings and outcome of the disease. The final diagnosis of spondylodiscitis was based on clinical, radiological and microbiological evidence, laboratory tests (acute phase parameters) and the response to antimicrobial therapy. In the differential diagnosis diseases such as: compression fracture, metastatic spinal lesions, erosive osteochondrosis, gout arthritis, aseptic bone necrosis were excluded.

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Table 1
Demographic data of analyzed patients.

Patient no.	Gender	Age	Predisposing factors
1	Female	52	Not present
2	Female	62	Not present
3	Male	64	Spine surgery (L3-L4-L5). Diabetes.
4	Male	44	Chronic kidney failure
5	Male	74	Vascular prosthesis because of aortic aneurysm
6	Male	67	Not present
7	Male	34	Spine surgery (L4-L5)
8	Male	21	Not present
9	Female	56	Not present
10	Male	45	Spine surgery (L4-L5)
11	Female	51	Spine surgery (L5-S1)

3. Results

The median age of the patients was 52 years and ranged from 21 to 74 years. The male to female ratio was 7:4.

Risk factors for spondylodiscitis were observed in 6 patients. Four patients had a history of recent spine surgery (and one of them also had diabetes); one patient had vascular prosthesis; one patient suffered from chronic kidney disease and one patient had a history of gangrenous cholecystitis and pleural empyema. Five patients had no identifiable risk factors. One or more comorbidities were presented in 8 patients. Concomitant degenerative spinal disease was found in 6 cases.

Tables 1 and 2 present demographic and clinical characteristics of the patients. In most cases diagnosis was delayed. The approximate time from onset of symptoms to diagnosis was from 2 to 7 months (median 45 days).

Table 2
Clinical characteristics and laboratory test of analyzed patients.

Patient no.	Diagnosis	Clinical symptoms	Body temperature (°C)	ESR (mm/h)	CRP (mg/l)	WBCs count ($\times 10^3/\text{mm}^3$)	Localization	Cultures
1	Vertebral osteomyelitis	Pain of the cervical spine during movement with radiation to the right upper limb. Limb weakness. Pain on palpation of the cervical spine.	36.6	34	0.3	5.8	C6-C7	Blood – negative
2	Discitis	Pain of the L-S spine region, radiating to right lower limb. Limb weakness. Pain on palpation of the spine L-S.	38.0	95	19.3	10.04	L2-L3	Material from intervertebral space – <i>Staphylococcus aureus</i> MSSA Blood – negative
3	Vertebral osteomyelitis. Sepsis	Pain of the L-S spine region, radiating to both lower limbs, escalating during movement. Limb weakness.	37.2	62	85.7	13.32	L3-L4-L5	Blood – <i>Staphylococcus warneri</i>
4	Vertebral osteomyelitis. Sepsis	Pain of the L-S spine region, radiating to both lower limbs. Limb weakness.	38.0	100	353.7	12.25	L3-L4-L5	Blood – <i>Staphylococcus aureus</i> MSSA
5	Vertebral osteomyelitis.	Pain of the L-S spine region, radiating to both lower limbs. Limb weakness. Pain on palpation of the spine.	36.8	98	64.6	10.4	L4-L5	Blood – <i>Staphylococcus aureus</i> MSSA (blood)
6	Vertebral osteomyelitis	Pain of the L-S spine, radiating to left lower limb. Limb weakness. Pain on palpation of the spine.	39.0	72	240.4	6.64	L4-L5	Blood – negative
7	Discitis	Pain of the L-S spine region, radiating to both lower limbs, escalating during movement. Limb weakness.	36.6	37	0.8	5.04	L4-L5	Blood – negative
8	Vertebral osteomyelitis. Sepsis	Pain of the L-S spine region, radiating to buttocks muscles, escalating during hips movements. Limb weakness.	40.0	116	81	7.7	L4-L5	Blood – <i>Staphylococcus aureus</i> MSSA
9	Vertebral osteomyelitis. Sepsis + septic shock	Pain of the L-S spine region, radiating to right lower limb. Limb weakness. Pain on palpation of the spine	39.0	76	204	10.8	L4-L5	Blood – <i>Escherichia coli</i>
10	Discitis	Pain of the L-S spine region, escalating during movement. Pain on palpation of the L-S spine.	36.6	46	9.0	9.4	L4-L5	Blood – negative
11	Discitis	Pain of the L-S spine region, radiating to both lower limbs. Limb weakness. Reduced mobility of the lumbar spine. Urinary incontinence.	37.0	42	7.4	6.49	L5-S1	Blood – negative

At admission to the Department all patients complained about localized back pain related to the sites of infection. Nine patients presented with pain in the lumbar spine region which radiated to one or both lower limbs; in 1 patient with infection of the lumbar spine pain radiated to the buttocks. In 1 case pain radiated to the right upper limb. Fever $\geq 38^\circ\text{C}$ was observed in 5 patients. One patient had urinary incontinence. Sepsis developed in 4 cases (in 1 case septic shock was present).

The most frequent localization of spondylodiscitis was lumbar spine (in 10 cases). Four patients presented with infection of two adjacent vertebrae and intervening intervertebral disk space; in 2 cases infection involved >2 contiguous vertebrae and intervening intervertebral disk space (*vertebral osteomyelitis*). In 4 patients infection was limited to intervertebral disk space without adjacent vertebrae (*discitis*). In 2 patients with lumbar spine involvement the inflammatory process spread to the paravertebral tissues.

C-reactive protein concentration (CRP) was measured in all patients before treatment and was elevated in 7 patients (>10.0 mg/L). The erythrocyte sedimentation rate (ESR) was increased in all patients (in all >30 mm/h). Leukocytosis ($>10,000$ WBCs/ mm^3) was present in 5 cases.

Pathogens were isolated from repeated sets of blood cultures in 5 cases. *Staphylococcus* spp. was found in 4 cases. *Escherichia coli* was isolated in 1 patient. In 1 case histopathologic examination and culture of the material from intervertebral space was performed. *Staphylococcus aureus* was isolated; histopathologic examination revealed pyogenic inflammation.

Initial MRI scan was performed in 10 patients. Typical changes were observed in 9 cases. Hypointensity of the vertebral bodies and intervertebral discs in T1-weighted images was observed and

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