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CASE REPORT Open Access

A case of late-onset spondylodiscitis within the longest duration: 9 years after posterior instrumentation

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Abstract

Background: Spondylodiscitis is infections of the intervertebral disc and adjacent vertebral body with insidious onset. These infections are primarily haematogenous in origin. Early spinal infections after posterior spinal instrumentation usually occur within 3 months after surgery, whereas late infections may occur up to 8 years after surgery but are rare with an incidence of 1.9%.

Case presentation: We describe the case of a 66-year-old woman who complained of febrile back pain and developed late-onset spondylodiscitis 9 years after pedicle screw fixation, which is the longest-onset case. She was treated with surgical instrument removal and thorough debridement of the infected tissue with long-term antimicrobial treatment, with excellent results.

Conclusions: If there is radiculopathy and fever associated with spinal surgery in the history, it should be remembered that evaluation of lumbar spine MRI and acute phase reactions is crucial, and spondylodiscitis should also be considered in the preliminary diagnosis even after 9 years.

Keywords: Late-onset, Spinal infection, Spondylodiscitis

Background

Spondylodiscitis is infections of the intervertebral disc and the adjacent vertebral body with insidious onset [1]. They have a silent clinical course and are therefore difficult to diagnose early [2]. These infections are primarily haematogenous in origin but may also be secondary to tuberculosis or Brucella infections [3]. The lumbar spine is most commonly affected, accounting for 58%, the thoracic spine for 30%, and the cervical spine for 11% [3]. The most commonly detected microorganisms are Staphylococcus aureus and coagulase-negative staphylococci, but despite invasive techniques, aetiologic diagnosis is not always possible [4].

The incidence of iatrogenic spondylodiscitis is increasing with the high number of spinal surgeries and the development of new diagnostic methods. The incidence after lumbar discectomy varies from 0.2 to 4% [4], whereas after posterior spinal fusion and instrumentation, the incidence ranges from 0 to 35% [5].

Early spinal infections after spinal instrumentation usually occur within 3 months of surgery [5, 6], whereas late infections can occur up to 8 years after surgery but are rare, with an incidence of 1.9% of all posterior spinal instrumentation [7]. We present a case of late-onset spondylodiscitis; that occurred 9 years after posterior instrumentation, which is the case that occurs after the longest duration.

Case presentation

A 66-year-old female patient presented with back and right leg pain that had persisted for 1 month. She also complained of night sweats, tremors, and fever that

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increased up to 39 degrees. It turned out that she had lumbar spinal stenosis and had been operated 9 years ago with bilateral transpedicular screws in the L4 and L5 vertebrae and two rods (Fig. 1). There were no other chronic diseases or previous infections in her medical history. Physical examination revealed restricted range of motion in the proximal muscle groups of both lower extremities, which was due to hyperalgesia. Right lower extremity thigh flexion and extension strength was 3/5; right dorsiflexion and EHL were 4/5.

On blood tests, the patient's white blood cell count was 18,800, with an erythrocyte sedimentation rate of 119 mm/h, a C-reactive protein value of 139.15 mg/dL, and a procalcitonin value of 0.83 ng/mL. Blood cultures were obtained, and tests performed to determine the cause of infection revealed no evidence of Brucella, tuberculosis, or infective endocarditis.

Computed tomography of the lumbar spine revealed pedicle screw fixators at the level of the L4–5 vertebrae. A degenerative vacuum phenomenon was noted in the lumbar intervertebral disc (Fig. 2). Because of the patient's allergy to contrast media, non-contrast-enhanced lumbar spine magnetic resonance imaging (MRI) was performed. In addition to an anterior bone fusion at the L4–5 level, prominent oedematous inflammatory changes were observed in both vertebrae and paravertebral areas (Fig. 3). At the same time, the intervertebral disc was found to be markedly narrowed, so spondylodiscitis was considered as a preliminary diagnosis.

The screws were surgically removed and thorough debridement of the infected tissue was performed (Fig. 4). A specimen from the lumbar region with an open biopsy was sent for pathological and microbiological examination. There was no multiplication in the patient's cultures. Microscopy revealed a strong neutrophilic leukocyte infiltration and palisading epithelioid histiocyte populations. Pathology revealed severe necrosis, inflammatory and focal granulomatous reaction.

She received ampicillin and sulbactam as her first empiric intravenous antibiotherapy. Five days later, treatment with piperacillin–tazobactam was started on the recommendation of the Infectious Diseases Clinic. One week later, antibiotherapy was switched to imipenem and cilastatin sodium. The patient was discharged with an oral antibiotic after intravenous antibiotic treatment was completed for 6 weeks.

Significant regression was observed on lumbar spine MRI scan in the first month of treatment (Fig. 5). It was observed that the pain of the patient, whose spine was immobilized and in whom no additional neurological deficits were noted, regressed with the infection markers. On blood tests at discharge, the patient's white blood cell count was 5940 with a sedimentation rate of 60 mm/h, a C-reactive protein value of 7.95 mg/dL, and a procalcitonin value of less than 0.12 ng/mL.

Conclusions

Infections can occur after all types of spinal surgery [8]. The incidence of iatrogenic spondylodiscitis is increasing with high number of spinal surgeries and the development of new diagnostic methods. In a retrospective study of 6120 cases of posterior spinal fusion and instrumentation, the authors reported 11 patients with postoperative anterior spondylodiscitis [9]. After posterior spinal instrumentation, the incidence ranged from 0 to 35% [5, 10]. Early spinal infections after instrumentation usually

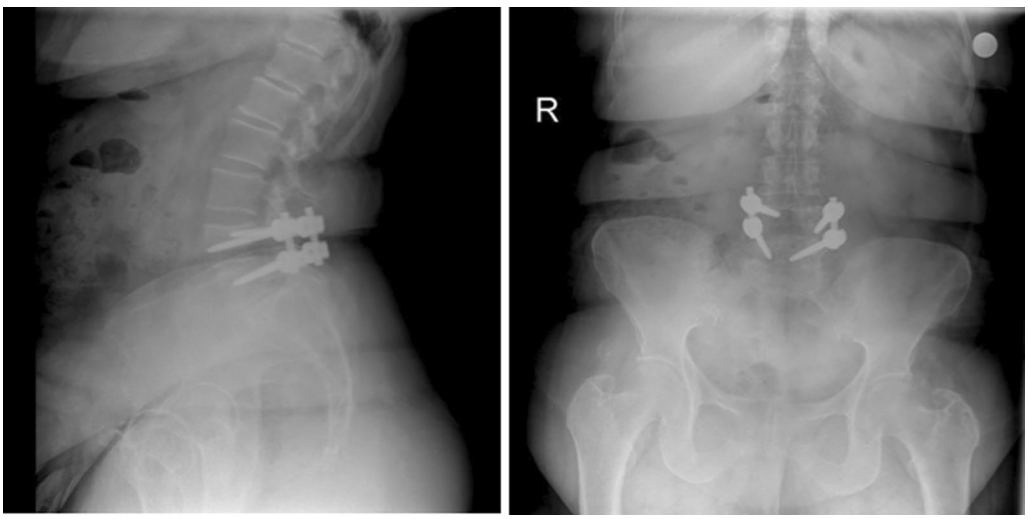


Fig. 1 Preoperative lumbo-sacral spinal direct graphy—lateral and AP views

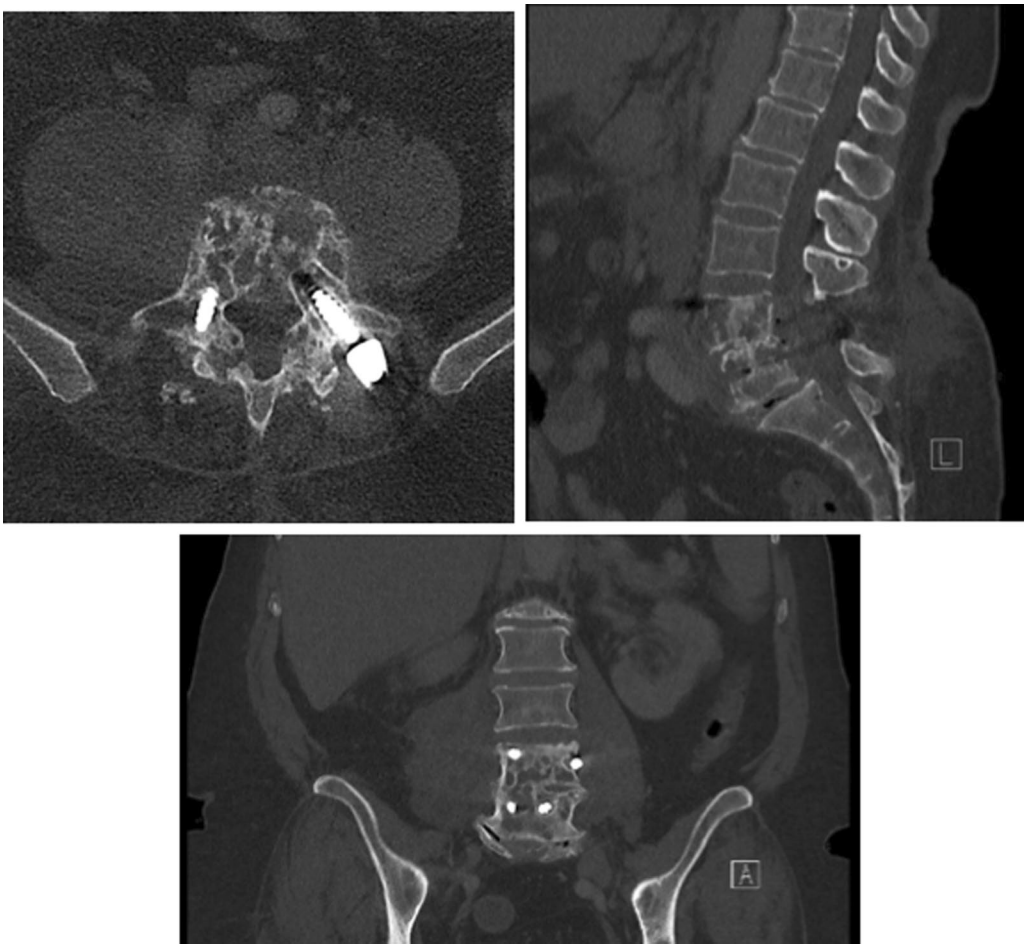


Fig. 2 Preoperative lumbo-sacral spinal CT—axial, sagittal, and coronal sections

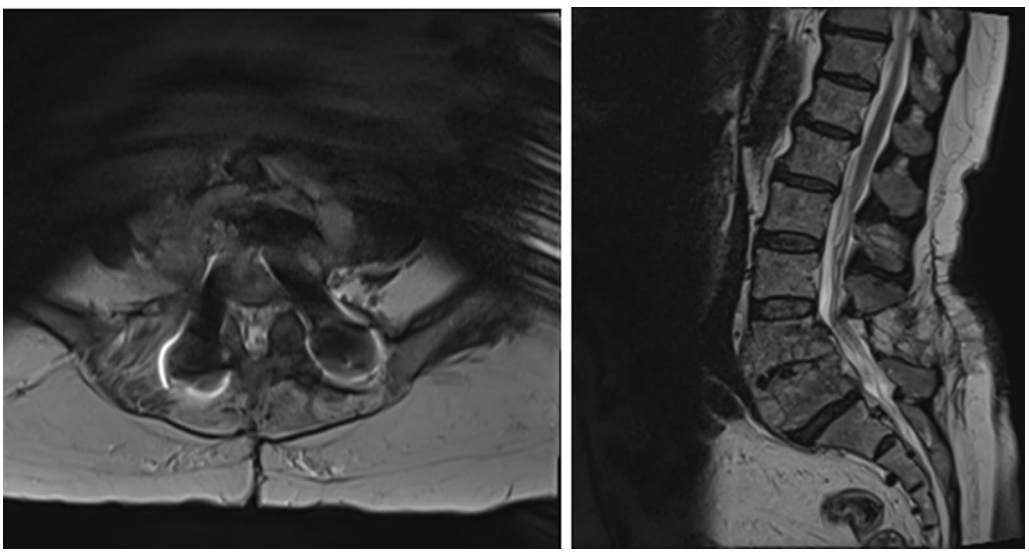


Fig. 3 Preoperative lumbo-sacral spinal MRI—axial and sagittal sections

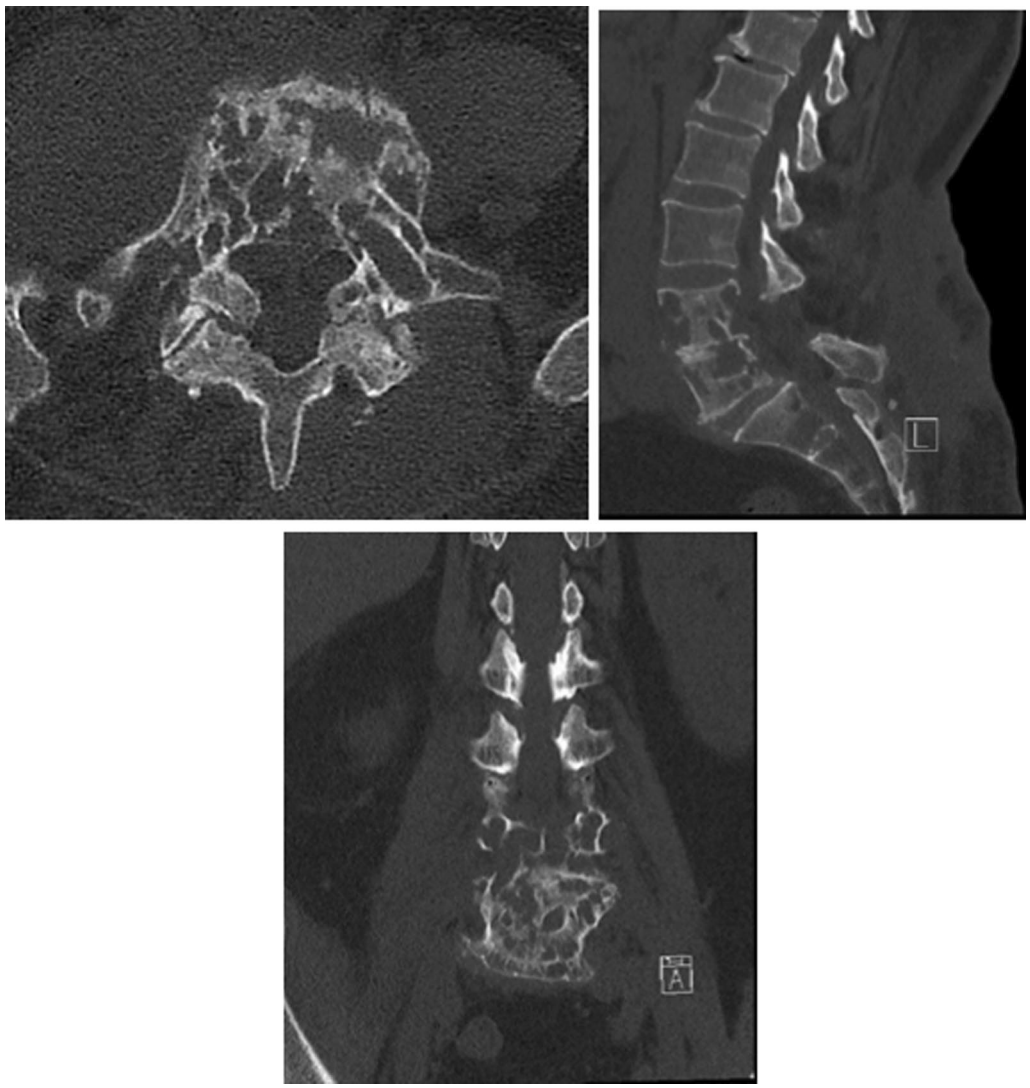


Fig. 4 Postoperative lumbo-sacral spinal CT—axial, sagittal, and coronal sections

occur within 3 months after surgery [5, 6]; whereas late infections can occur up to 8 years after surgery but are rare, with an incidence of 1.9% of all posterior instrumentation [7].

Late-onset spondylodiscitis and psoas abscess 5 years after percutaneous balloon kyphoplasty have been reported [11]. Late tuberculous spondylodiscitis 8 years after discectomy was described by Lotfinia and Vahedi [12]. Besides these long duration periods; no case of spondylodiscitis 9 years after posterior spine surgery has been described so far. Thus, this case demonstrated that the risk of infection persists for up to 9 years after surgery.

The goals of treating spinal infections are to eliminate the microbial pathogen, preserve neurological function, and restore spinal stability and morphology [2, 13, 14]. Antibiotic treatment should be postponed until samples for cultures have been obtained. In the case of negative cultures, intravenous empiric broad-spectrum antibiotic treatment for 6 weeks is recommended for pyogenic spondylodiscitis, and we have adhered to this time period [15].

In addition to conservative treatments, surgical treatment should be considered if symptoms worsen and if inflammatory indicators do not show signs of normalization [16, 17]. In addition, implant infections are considered the main cause of late-onset spinal pain after instrumentation [18, 19]. Biofilm-forming organisms are the main cause of late-onset infections, especially in spondylodiscitis after instrumentation. Therefore,

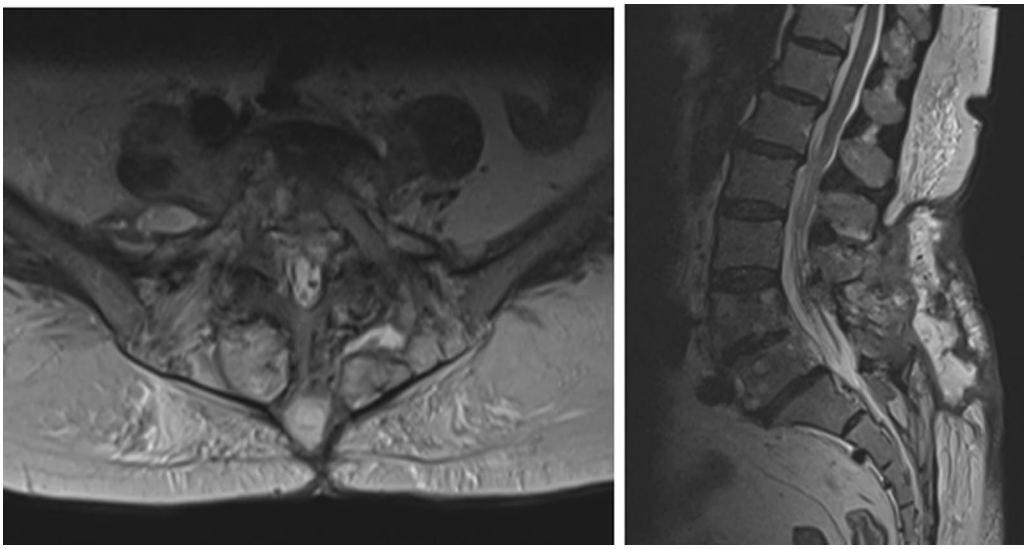


Fig. 5 Postoperative lumbo-sacral spinal MRI—axial and sagittal sections

removal of the foreign body is recommended for its eradication, whereas maintaining instrumentation after delayed infection leads to more morbidity and less success [20]. Our patient was treated with surgical instrument removal and thorough debridement of the infected tissue with concomitant long-term antimicrobial treatment, with excellent results.

If there is radiculopathy and fever associated with spinal surgery history, it should be remembered that evaluation of lumbar spine MRI and acute phase reactants is crucial, and spondylodiscitis should also be considered in the preliminary diagnosis even after 9 years.

Abbreviations
MRI: Magnetic resonance imaging.

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Not applicable.

Author contributions
OB and YK performed a literature research and analysis of originality of the case. The writing phase was done by the whole team. AYY and IA were supervised. All authors read and approved the final manuscript.

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Ethics approval and consent to participate
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Consent for publication
Written informed consent was obtained from the patient included in this study.

Competing interests
The authors declare that they have no competing interests.

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