

A Case Report of Vertebral Osteomyelitis Caused by *Peptostreptococcus micros*

Junya Shimizu¹, Mitsunori Yoshimoto¹, Tsuneo Takebayashi¹, Yoshinori Terashima¹, Toshihiko Yamashita¹

Learning Point for the Article:

If a patient who was in immunodepression status develops severe back pain, the clinician should be suspicious of the possibility of spondylitis by *P. micros* and start antibiotic therapy after undergoing sample collection.

Abstract

Introduction: Anaerobic vertebral osteomyelitis has been reported rarely. In this report, we describe an extremely rare case of a patient who suffered from vertebral osteomyelitis caused by *Peptostreptococcus micros*.

Case Report: A 73-year-old man with a history of diabetes mellitus was admitted to our hospital with a 5-month history of severe low back pain. A radiograph of the lumbar spine demonstrated intervertebral disc space narrowing with indistinct end plates at the L3-L4 level. T2-weighted magnetic resonance image showed high signal intensity at L3-L4 intervertebral disc space. We suspected pyogenic spondylitis and performed percutaneous posterolateral endoscopic debridement. The results of intraoperative sample cultures were positive for *P. micros*, an anaerobic Gram-positive coccus. He was treated by the antibiotic therapy. Low back pain resolved and his white blood cell count and C-reactive protein levels remained normal with the combination therapy. During 2-year follow-up, he reported no low back pain and had no signs of infection recurrence.

Conclusion: If a patient who was in immunodepression status develops severe back pain, the clinician should be suspicious of the possibility of spondylitis by *P. micros* and start antibiotic therapy after undergoing sample collection.

Keywords: Vertebral osteomyelitis, *Peptostreptococcus micros*, endoscopic debridement, anaerobic Gram-positive cocci.

Introduction:

Anaerobic vertebral osteomyelitis has been reported rarely. *Peptostreptococcus micros* is one kind of anaerobic Gram-positive cocci and normally encountered in the oral cavity and respiratory, gastrointestinal, and female genitourinary tracts [1, 2, 3]. In this report, we describe an extremely rare case of a patient who suffered from vertebral osteomyelitis caused by *P. micros*.

Case Report:

A 73-year-old man with a history of diabetes mellitus was admitted to our hospital with a 5-month history of severe low

back pain. On admission, he had no fever, and neurological evaluation was within normal limits. A lateral radiograph of the lumbar spine demonstrated intervertebral disc space narrowing with indistinct end plates at the L3-L4 level. A computed tomography (CT) scan revealed destruction of the posterior wall and sclerotic changes of the vertebral body at L3 and L4 (Fig. 1). T2-weighted magnetic resonance imaging (MRI) showed a high signal intensity area at the L3-L4 intervertebral disc (Fig. 2). His white blood cell count was 8400/ μ L, and C-reactive protein level was 2.37 mg/dL. Initially, we suspected pyogenic spondylitis and encouraged him to rest with a lumbosacral corset. Percutaneous posterolateral endoscopic

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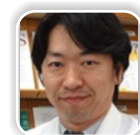
Dr. Junya Shimizu



Dr. Mitsunori Yoshimoto



Dr. Tsuneo Takebayashi



Dr. Yoshinori Terashima



Dr. Toshihiko Yamashita

¹Department of Orthopaedic Surgery, Sapporo Medical University School of Medicine, Sapporo, Japan.

Address of Correspondence:

Dr. Junya Shimizu,
Department of Orthopaedic Surgery, Sapporo Medical University School of Medicine, S1 W16, Sapporo, Hokkaido, 060-8543, Japan.
E-mail: junya49jp@yahoo.co.jp



Figure 1: Sagittal computed tomography scan showing the destruction of the posterior wall and the sclerotic changes of the vertebral body at L3 and L4 (arrow).

debridement and irrigation of the intervertebral disc according to Ito's procedure [4] were performed 6 days after admission. Surgery was performed with the patient in the prone position, using the Yeung endoscopic spinal system (Richard Wolf Medical Instruments, Vernon Hills, IL, USA). A micro endoscope was obliquely inserted at 45° to the vertical line, targeting the center of the disc space. Aggressive debridement of the infected disc material and saline irrigation was performed. A 3-mm diameter drain tube was placed in the disc space, and drainage continued for 7 days

after the surgery. After the surgery, he received antibiotics starting with 1 g cefazolin empirically administered intravenously 3 times daily for 10 days. Blood and urine samples remained sterile. Although gradual improvement was seen in the inflammatory response, his low back pain continued. Intraoperative sample culture results tested with the Rap ANA II SYSTEM (Norcross, GA, USA) and were positive for *P. micros*, which is sensitive to piperacillin. Therefore, we changed

the antibiotics to 1 g piperacillin intravenously 3 times daily for the next 35 days. After that, he developed a rash all over his body. We suspected drug eruption and changed the antibiotics to 600 mg clindamycin intravenously twice daily for the next 12 days. Because his low back pain gradually subsided and inflammatory response became negative 8 weeks after the surgery, we prescribed 200 mg oral minocycline daily for 7 months. He was discharged 2 months after the surgery. 8 months after initiation of treatment, radiographs and CT scans of his lumbar spine

showed sclerotic endplate changes, and T2-weighted MRI revealed restored signal intensity at the L3-L4 intervertebral disc. He reported no low back pain and had no signs of infection recurrence.

Discussion:

Pyogenic spondylodiscitis is usually caused by aerobic organisms, and vertebral osteomyelitis due to anaerobic bacteria is extremely rare. Han et al. [5] reported that anaerobic vertebral osteomyelitis appeared to account for <3% of all spondylodiscitis cases. Some authors [5, 6] reported that the most frequent organisms responsible for anaerobic spondylodiscitis were *Bacteroides* species, *Propionibacterium acnes*, and *Peptococcus* species. Vertebral osteomyelitis caused by *Peptostreptococcus* species, which is a type of anaerobic Gram-positive cocci, is exceedingly uncommon. To the best of our knowledge, only four cases of spondylodiscitis due to *Peptostreptococcus* species have been reported. Because most *P. micros* are found in the oral cavity, the intestines, and the female genitourinary tract, bone infections caused by *P. micros* generally occur after dental and sinus infections or pelvic infections in women [7, 8, 9, 10]. Immunocompromised status or past operations may also be risk factors for anaerobic vertebral osteomyelitis. In this case, the patient had no oral infections or past operations, but he had diabetes mellitus. The main symptoms associated with anaerobic vertebral osteomyelitis are back pain, fever, and motor neurologic deficits, which are similar to the symptoms of aerobic vertebral infections [6]. In addition, radiograph and MRI findings of anaerobic spondylodiscitis are also similar to aerobic spondylodiscitis [4, 6]. Therefore, distinguishing anaerobic spondylodiscitis from aerobic vertebral infections by symptoms and images alone may be difficult. In fact, as Saeed et al. pointed out, we have not been able to identify any features typically found in patients with infection due to *P. micros*. One of the reasons vertebral osteomyelitis caused by *P. micros* is rarely diagnosed may be the difficulty of specimen isolation. Positive blood cultures are uncommon, accounting for only 24–62% of cases of anaerobic spondylodiscitis [6]. Brook [11] reported that isolating *Peptostreptococcus* required appropriate methods of sample collection, transportation, and cultivation. However, although anaerobic culture techniques have improved recently, culture-proven anaerobic vertebral osteomyelitis remains rare, perhaps, because of widespread antibiotic administration before taking biopsy specimens. In fact, in all four culture-proven cases of vertebral osteomyelitis due to *Peptostreptococcus* species, biopsies were performed before administering antibiotics. Therefore, early intervertebral disc biopsy with the appropriate culture



Figure 2: Sagittal T2-weighted magnetic resonance image showing high signal intensity at L3-L4 intervertebral disc space (arrow).

technique should be considered to identify the causative agent before empiric administration of antibiotics. In general, anaerobic organisms have relatively low virulence and are sensitive to some types of antibiotics such as clindamycin, penicillin G, ceftriaxone, and metronidazole. Among others, clindamycin is now recommended because of having good bioavailability against Gram-positive anaerobes such as *P. micros*. Zimmerli [12] suggested that the first choice of treatment for anaerobic vertebral osteomyelitis should be 300–600 mg of clindamycin administered intravenously every 6–8 h. In past reports, in fact, all patients affected with anaerobic vertebral osteomyelitis caused by *P. micros* received antibiotics including clindamycin and recovered or improved.

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Conclusion:

We report a rare case of vertebral osteomyelitis caused by *P. micros*. If a patient who was in immunodepression status develops severe back pain, the clinician should be suspicious of the possibility of spondylitis by *P. micros* and start antibiotic therapy after undergoing sample collection.

Clinical Message

If a patient who was in immunodepression status develops severe back pain, the clinician should be suspicious of the possibility of spondylitis by *P. micros* and start antibiotic therapy after undergoing sample collection.

Conflict of Interest: Nil
Source of Support: Nil

Consent: The authors confirm that Informed consent of the patient is taken for publication of this case report

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