



Contents lists available at ScienceDirect

## International Journal of Surgery Case Reports

journal homepage: [www.casereports.com](http://www.casereports.com)Pyogenic discitis due to *Abiotrophia adiacens*<sup>☆</sup>Kosuke Uehara<sup>a,\*</sup>, Hirotaka Chikuda<sup>a</sup>, Yoshimi Higurashi<sup>b</sup>, Kiyofumi Ohkusu<sup>c</sup>,  
Katsushi Takeshita<sup>a</sup>, Atsushi Seichi<sup>a</sup>, Sakae Tanaka<sup>a</sup><sup>a</sup> Department of Orthopaedic Surgery, Faculty of Medicine, The University of Tokyo, Tokyo, Japan<sup>b</sup> Department of Infection Control and Prevention, University of Tokyo Hospital, Tokyo, Japan<sup>c</sup> Department of Microbiology Regeneration and Advanced Medical Science, Gifu University, Graduate School of Medicine, Gifu, Japan

## ARTICLE INFO

## Article history:

Received 16 June 2013

Received in revised form 9 September 2013

Accepted 29 September 2013

Available online 2 October 2013

## Keywords:

Discitis

*Abiotrophia*

Nutritionally variant streptococci

Diagnosis

Culture-negative

## ABSTRACT

**INTRODUCTION:** *Abiotrophia* species have been referred to as nutritionally variant streptococci because of their fastidious nutritional requirements for growth. *Abiotrophia* species are difficult to identify with conventional solid culture.

**PRESENTATION OF CASE:** A 48-year-old woman was admitted to our hospital with severe low back pain and body temperature of 38.2 °C. Magnetic resonance imaging revealed edema and contrast enhancement of the L4 and L5 vertebral bodies with high signal intensity in the L3–4 and L4–5 intervertebral discs on the T2-weighted images. The patient underwent needle biopsy of the L3–4 disk. Cultures of disk biopsy samples and blood yielded gram positive cocci in short chains with scanty growth on chocolate agar. Further subculture with supplemented medium and subsequent 16S ribosomal RNA gene sequencing identified the pathogen as *Abiotrophia adiacens*. The patient was treated with intravenous ampicillin. At 6-month follow-up, the patient was free of symptoms.

**DISCUSSION:** Causative microorganisms remain unidentified in 25–40% of spinal infection cases. *Abiotrophia* species grow poorly on conventional solid media, and require pyridoxal or thiol group supplementation. Use of Brucella HK agar or GAM agar plate is helpful for detection of *Abiotrophia* species. We first confirmed the diagnosis by direct identification of *Abiotrophia adiacens* from infected disk. *Abiotrophia* species are one of the major pathogens of infective endocarditis accounting for 5% of cases. Considering their fastidious nature, it is likely that most cases of *Abiotrophia* discitis are falsely classified as culture-negative discitis; therefore, their role in pyogenic discitis may be underestimated.

**CONCLUSION:** Subculture using nutritionally supplemented media is crucial for their identification.

© 2013 The Authors. Published by Elsevier Ltd on behalf of Surgical Associates Ltd. All rights reserved.

## 1. Introduction

*Abiotrophia* species have been referred to as nutritionally variant streptococci because of their fastidious nutritional requirements for growth. The organisms are part of the normal oral, genitourinary, and intestinal floras. *Abiotrophia* species sometimes cause sepsis and bacteremia, and are especially known as one of the major pathogens of infective endocarditis. *Abiotrophia* species are difficult to identify with conventional solid culture.<sup>1</sup> The authors describe a rare case of spondylodiscitis due to *Abiotrophia adiacens*.

## 2. Presentation of case

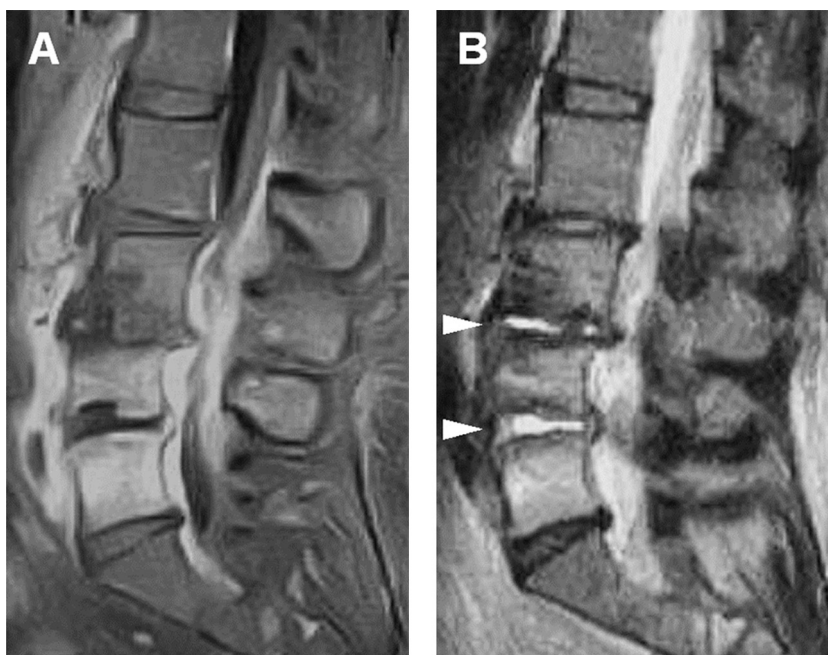
A 48-year-old unemployed woman was admitted to our hospital with a two-week history of severe low back pain. She suffered from Parkinson's disease, but she was not a compromised host. On admission, she was unable to sit up because of the pain. Her vital signs were as follows: temperature 38.2 °C, pulse 80 beats/min, and blood pressure 100/68 mmHg. Physical examination revealed moderate tenderness to palpation on the spinous processes of lower lumbar spine. She was neurologically intact, except for slight weakness in her right toe. The peripheral white blood cell count was 11,600/mm<sup>3</sup>, and her C-reactive protein level was 9.9 mg/dl. Plain X-ray showed degenerative changes of the lumbar vertebrae with narrowing of the disk spaces at L3–4, and L4–5. Magnetic resonance imaging revealed edema and contrast enhancement of the L4 and L5 vertebral bodies with high signal intensity in the L3–4 and L4–5 intervertebral discs on the T2-weighted images (Fig. 1).

The patient underwent needle biopsy of the L3–4 disk using fluoroscopy. Histological studies showed infiltration of neutrophils

<sup>☆</sup> This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike License, which permits non-commercial use, distribution, and reproduction in any medium, provided the original author and source are credited.

\* Corresponding author at: Department of Orthopaedic Surgery, Faculty of Medicine, The University of Tokyo, Hongo 7-3-1 Bunkyo-ku, Tokyo 113-0033, Japan. Tel.: +81 3 3815 5411x37380; fax: +81 3 3818 4082.

E-mail address: [uehara-ko@room.ocn.ne.jp](mailto:uehara-ko@room.ocn.ne.jp) (K. Uehara).



**Fig. 1.** (A) A sagittal postcontrast (Gd-DTPA) T1-weighted image (MRI) demonstrates contrast enhancement of L4 and L5 vertebral bodies; (B) A sagittal T2-weighted image shows increased signal at L3-4 and L4-5 disk space (arrowheads).

**Table 1**

Reported cases of the discitis due to nutritionally variant streptococcus.

	Age, sex	Level	Pathogen	Culture
Heath (1998)	45 M	L2–L4	<i>A. adiacens</i>	Blood
	50 M	L3–L5	<i>A. adiacens</i>	Blood
Rosenthal (2002)	68 M	T11–T12	<i>A. adiacens</i>	Blood
Wilhelm (2005)	51 M	L2–S1	<i>A. defectiva</i>	Blood
Present case	48 F	L3–L5	<i>A. adiacens</i>	Disk, blood

and deposition of fibrin. Cultures of disk biopsy samples and blood yielded gram positive cocci in short chains with scanty growth on chocolate agar. Further subculture with supplemented medium and subsequent 16S ribosomal RNA gene sequencing identified the pathogen as *Abiotrophia adiacens*.

As a result of the survey regarding bacteremia origin, we could detect the dental caries. The patient was treated with intravenous ampicillin (8 g/day) for 6 weeks. The clinical and laboratory test abnormalities improved within 2 weeks. At 6-month follow-up, the patient was free of symptoms without sign of relapse of the infection.

### 3. Discussion

Spinal infections can be devastating and result in significant pain, deformity, and neurologic deterioration.<sup>2,3</sup> *Staphylococcus aureus* is the most common etiologic organism of spinal infections, followed by *Escherichia coli*, *Streptococcus* species, *S. epidermidis*, and *Pseudomonas* species; however, causative microorganism remain unidentified in 25–40% of the cases.

*Abiotrophia* species (*A. adiacens* and *A. defectiva*) have formerly been referred to as nutritionally variant streptococci because of their fastidious nutritional growth requirements.<sup>1</sup> The organisms grow poorly on conventional solid media, and require pyridoxal or thiol group supplementation. Use of Brucella HK agar or GAM agar plate is helpful for detection of *Abiotrophia* species. Prolonged incubation (at least 72 h) is also recommended.

Spinal infection due to *Abiotrophia* species is extremely rare, and only four cases have been reported to date (Table 1).<sup>4–6</sup> In the

previous reports, this organism was identified only from blood sample by using Columbia blood and chocolate agar plates. In the present case, we first confirmed the diagnosis by direct identification of *Abiotrophia adiacens* from infected disk.

*Abiotrophia* species are one of the major pathogens of infective endocarditis accounting for 5% of cases. *Abiotrophia* endocarditis carries higher morbidity and mortality than endocarditis caused by other Streptococci, reflecting their strong virulence. *Abiotrophia* discitis reported previously occurred concomitantly with infective endocarditis although repeated echocardiography showed normal study in our case. Patients with history of infective endocarditis or valve disease may be candidate for exploration of *Abiotrophia* discitis. We were able to detect her dental cavity, and it could be a predisposing factor of bacteremia.

Considering their fastidious nature, it is likely that most cases of *Abiotrophia* discitis are falsely classified as culture-negative discitis; therefore, their role in pyogenic discitis may be underestimated.

### 4. Conclusion

Adequate diagnosis and treatment of this entity requires a high index of suspicion for the organism, even if cultures are negative. Subculture using nutritionally supplemented media is crucial for their identification.

### Conflict of interest

None to declare.

### Funding

None to declare.

### Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy

of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Author contributions

K.U. assisted in the surgery, was involved in the preoperative work up and postoperative care of the patient, and wrote the paper.

H.C. performed the surgery, was involved in the preoperative work up and postoperative care of the patient, and helped in the preparation of the write up.

K.T., A.S. and S.T. were involved in the preoperative work up and postoperative care of the patient, and revised the final article.

Y.H. and K.O. involved in the bacteriological investigations.

#### References

1. Ruoff KL. Nutritionally variant streptococci. *Clin Microbiol Rev* 1991;**4**: 184–90.
2. An HS, Seldomridge JA. Spinal infections: diagnostic tests and imaging studies. *Clin Orthop Relat Res* 2006;**444**:27–33.
3. Govender S. Spinal infections. *J Bone Joint Surg Br* 2005;**87**:1454–8.
4. Heath CH, Bowen SF, McCarthy JS, Dwyer B. Vertebral osteomyelitis and discitis associated with *Abiotrophia* adiacens (nutritionally variant streptococcus) infection. *Aust N Z J Med* 1998;**28**:663.
5. Wilhelm N, Sire S, Le Coustumier A, Loubinoux J, Beljerd M, Bouvet A. First case of multiple discitis and sacroiliitis due to *Abiotrophia* defectiva. *Eur J Clin Microbiol Infect Dis* 2005;**24**:76–8.
6. Rosenthal O, Woywodt A, Kirschner P, Haller H. Vertebral osteomyelitis and endocarditis of a pacemaker lead due to *Granulicatella* (*Abiotrophia*) adiacens. *Infection* 2002;**30**:317–9.

#### Open Access

This article is published Open Access at [scimedirect.com](http://scimedirect.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.