

Case report

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Post-ERCP bacteremia caused by *Alcaligenes xylosoxidans* in a patient with pancreas cancer

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Abstract

Alcaligenes xylosoxidans is an aerobic, motile, oxidase and catalase positive, nonfermentative Gram negative bacillus. This bacterium has been isolated from intestine of humans and from various hospital or environmental water sources. *A.xylosoxidans* is both waterborne and results from the poor-hygienic conditions healthcare workers are in. In this case report, the bacteremia which appeared in a patient with pancreas cancer after ERCP was described.

Background

Bacteremia is a rare complication of endoscopic retrograde cholangiopancreatography (ERCP) and biliary stents. The rate of post-ERCP cholangitis and sepsis ranges from 0.5% to 3.0% [1,2].

Alcaligenes xylosoxidans is a rare cause of bacteremia. This organism, also known as *Achromobacter xylosoxidans*, is an aerobic, motile, oxidase and catalase positive, nonfermentative Gram negative bacillus. *A.xylosoxidans* is opportunistic and usually affects severely immunocompromised patients such as those with neutropenia and those with a malignant or cardiovascular disease [3,4]. This microorganism has been isolated from blood, cerebrospinal fluid, stool, urine, sputum, peritoneal fluid, skin, ear discharge, wounds, abscesses, bone, joints, endocardium and central venous catheters [3-8].

In the present report is described a case with bacteremia due to *A.xylosoxidans* post-ERCP in patient of pancreas cancer.

Case report

A 70-year-old man was admitted to our hospital with a 10-day history of jaundice and abdominal pain. The patient is known to have suffered from pancreas cancer for three months and he was received second cycle of chemotherapy before one month. His vitality signs were: blood pressure was 110/70 mmHg, body temperature 36.3°C and pulse rate 68/min. His peripheral white blood cell count was $6.4 \times 10^9/L$, erythrocyte sedimentation rate was 72 mm/h and C-reactive protein was 4.6 mg/dL. Four days later, the stent was placed into the biliary tract with ERCP. One day later, the patient was lethargic. His vitality signs were: blood pressure was 90/50 mmHg, body temperature 39.7°C and pulse rate 112/min. His peripheral white blood cell count was $14.1 \times 10^9/L$ with 86% neutrophils

and 8% lymphocytes. His erythrocyte sedimentation rate was 80 mm/h and C-reactive protein was 11.2 mg/dL. Blood and urine specimens were taken for microbiological analysis. We started to administer empirical treatment with ceftriaxone (1000 mg per 12 h; IV) to the patient. In blood culture (Bactec 9240; Becton Dickinson, Sparks, Md.), Gram negative bacillus was found to have reproduced. This microorganism identified with the help of Phoenix system (Becton Dickinson, Sparks, Md.) and biochemical tests. It was called as *A.xylosoxidans*. *A.xylosoxidans* was distinguished from other Alcaligenes species by acidification of oxidative-fermentative (OF) glucose and xylose. Key characteristics of *A.xylosoxidans* are shown in Table 1.

The urine culture was sterile. Three days later, the initial treatment was modified to ciprofloxacin (200 mg per 12 h; IV) according to antimicrobial susceptibility test. In-vitro susceptibility data are shown in Table 2. This isolate is an ESBL producer. Five days later, the clinical condition of the patient improved. He was discharged in a good clinical condition after 15 days.

Discussion

Obstruction of the bile duct by stones or tumor can facilitate bacterial colonization; subsequent instrumentation has resulted in bacteremia rates mean 18.0%. [9,10]. The highest bacteremia rates are seen in therapeutic ERCP. In purely diagnostic ERCP, the bacteremic rate is lower at 8% [10,11]. The microorganism most responsible for post-ERCP bacteremia is *Escherichia coli* [9]. *A.xylosoxidans* is a rare but important cause of bacteremia in immunocompromised patients. The gastrointestinal tract has been suggested as a source for *A.xylosoxidans* bacteremia in patients with cancer [12]. Our case report is the first one associated with *A.xylosoxidans* that causes post-ERCP bacteremia.

Table 1: Key characteristics of *A.xylosoxidans*

Tests	Results
Oxidase	+
Catalase	+
OF xylose	Acid reaction
OF glucose	Acid reaction
Arginine	-
Citrate	+
Ketoglutaric acid	+
Gamma glutamil	+
NO ₃ to NO ₂	+
Acetamide	+
Lysine	-
Mannitol	-
Urease	-
Motility	+

Table 2: In-vitro susceptibility profile of *A.xylosoxidans*

Antimicrobial agent	Susceptibility
Amikacin	Resistant
Cefoperazone/sulbactam	Sensitive
Cefotaxime	Resistant
Ceftazidime	Resistant
Ceftriaxone	Resistant
Ciprofloxacin	Sensitive
Imipenem	Sensitive
Piperacillin/tazobactam	Sensitive
Tobramycin	Resistant
Trimethoprim/sulfamethoxazole	Sensitive

A.xylosoxidans has been isolated from intestine of humans and from various hospital or environmental water sources [13]. The natural sources of *A.xylosoxidans* infections are well water, tap water, swimming pools, and moist soil [14,15]. *A.xylosoxidans* causing nosocomial infections is waterborne (disinfectant solutions, intravenous fluids, dialysis solutions) and results from the fact that health-care workers do not use gloves [13,15,16]. In our case, peripheral factors were analysed as a source of infection but any environmental contamination couldn't be indicated. That the patient had symptoms of infection one day after ERCP made us think that the infection was from the intestines.

A.xylosoxidans is a weakly virulent microorganism. In general, there is an underlying disease in patients. *A.xylosoxidans* have been reported in patients with cancer, neutropenia, bone marrow or liver transplant, renal failure, cystic fibrosis, HIV infection, IgM deficiency, neonates [4-6,15,17].

This report showed that *A.xylosoxidans* was sensitive to cefoperazone/sulbactam, ciprofloxacin, imipenem, piperacillin/tazobactam and trimethoprim/sulfamethoxazole and resistant to the third generation cephalosporins with the exception of the cefoperazone/sulbactam, amikacin and tobramycin. In previous studies, it was reported that *A.xylosoxidans* was resistant to most of the antimicrobial agents [15,17,18].

In summary, the post-ERCP bacteremia caused by *A.xylosoxidans* was presented in a 70-year-old man with pancreas cancer. The case report may help to redefine the role of *A.xylosoxidans* in post ERCP infections. The association of *A.xylosoxidans* with bacteremia further extends the clinical spectrum of this rare pathogen. This unusual case highlights that an effective antimicrobial therapy based on an immediate microbiological analysis may be life-saving in patients presenting a severe complication of ERCP.

References

- Loperfido S, Angelini G, Benedetti G, Chilovi F, Costan F, De Berardinis F, De Bernardin M, Ederle A, Fina P, Fratton A: **Major early complications from diagnostic and therapeutic ERCP: a prospective multicenter study.** *Gastrointest Endosc* 1998, **48**:1-10.
- Masci E, Toti G, Mariani A, Curioni S, Lomazzi A, Dinelli M, Minoli G, Crosta C, Comin U, Fertitta A, Prada A, Passoni GR, Testoni PA: **Complications of diagnostic and therapeutic ERCP: a prospective multicenter study.** *Am J Gastroenterol* 2001, **96**:417-423.
- Duggan JM, Goldstein SJ, Chenoweth CE, Kauffman CA, Bradley SF: **Achromobacter xylosoxidans bacteremia: report of four cases and review of the literature.** *Clin Infect Dis* 1996, **23**:569-576.
- Aisenberg G, Rolston KV, Safdar A: **Bacteremia caused by Achromobacter and Alcaligenes species in 46 patients with cancer (1989-2003).** *Cancer* 2004, **101**:2134-2140.
- Gradon JD, Mayrer AR, Hayes J: **Pulmonary abscess associated with Alcaligenes xylosoxidans in a patient with AIDS.** *Clin Infect Dis* 1993, **17**:1071-1072.
- Ahn Y, Kim NH, Shin DH, Park OY, Kim W, Jeong MH, Cho JG, Park JC, Kang JC: **Pacemaker lead endocarditis caused by Achromobacter xylosoxidans.** *J Korean Med Sci* 2004, **19**:291-293.
- Weissgold DJ, Kirkpatrick B, Iverson M: **Acute postoperative Alcaligenes xylosoxidans endophthalmitis.** *Retina* 2003, **23**:578-580.
- Ramos JM, Domine M, Ponte MC, Soriano F: **Bacteremia caused by Alcaligenes (Achromobacter) xylosoxidans. Description of 3 cases and review of the literature.** *Enferm InfeccMicrobiol Clin* 1996, **14**:436-440.
- Leung JW, Ling TK, Chan RC, Cheung SW, Lai CW, Sung JJ, Chung SC, Cheng AF: **Antibiotics, biliary sepsis, and bile duct stones.** *Gastrointest Endosc* 1994, **40**:716-721.
- Kullman E, Borch K, Lindstrom E, Ansehn S, Ihse I, Anderberg B: **Bacteremia following diagnostic and therapeutic ERCP.** *Gastrointest Endosc* 1992, **38**:444-449.
- Mollison LC, Desmond PV, Stockman KA, Andrew JH, Watson K, Shaw G, Breen K: **A prospective study of septic complications of endoscopic retrograde cholangiopancreatography.** *J Gastroenterol Hepatol* 1994, **9**:55-59.
- Legrand C, Anaissie E: **Bacteremia due to Achromobacter xylosoxidans in patients with cancer.** *Clin Infect Dis* 1992, **14**:479-484.
- Vu-Thien H, Darbord JC, Moissenet D, Dulot C, Dufourcq JB, Marsol P, Garbarg-Chenon A: **Investigation of an outbreak of wound infections due to Alcaligenes xylosoxidans transmitted by chlorhexidine in a burns unit.** *Eur J Clin Microbiol Infect Dis* 1998, **17**:724-726.
- Spear JB, Fuhrer J, Kirby BD: **Achromobacter xylosoxidans (Alcaligenes xylosoxidans subsp. xylosoxidans) bacteremia associated with a well-water source: case report and review of the literature.** *J Clin Microbiol* 1988, **26**:598-599.
- Reverdy ME, Freney J, Fleurette J, Coulet M, Surgot M, Marmet D, Ploton C: **Nosocomial colonization and infection by Achromobacter xylosoxidans.** *J Clin Microbiol* 1984, **19**:140-143.
- Gomez-Cerezo J, Suarez I, Rios JJ, Pena P, Garcia de Miguel MJ, de Jose M, Monteagudo O, Linares P, Barbado-Cano A, Vazquez JJ: **Achromobacter xylosoxidans bacteremia: a 10-year analysis of 54 cases.** *Eur J Clin Microbiol Infect Dis* 2003, **22**:360-363.
- Weitkamp JH, Tang YW, Haas DW, Midha NK, Crowe JE Jr: **Recurrent Achromobacter xylosoxidans bacteremia associated with persistent lymph node infection in a patient with hyperimmunoglobulin M syndrome.** *Clin Infect Dis* 2000, **31**:1183-1187.
- Mandell WF, Garvey GJ, Neu HC: **Achromobacter xylosoxidans bacteremia.** *Rev Infect Dis* 1987, **9**:1001-1005.

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