LUPINE PUBLISHERS

Current Trends on Biotechnology & Microbiology

DOI: 10.32474/CTBM.2021.02.000142

ISSN: 2641-6875

Case Report

Sepsis Due to Co-Infection with Human Papillomavirus and *Acinetobacter Schindleri* after Surgery for Uterine Fibroids

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Received: October 25, 2021 **Published:** November 24, 2021

Keywords: Sepsis; Uterine Fibroid Surgery; Human Papillomavirus; *Acinetobacter Schindleri*; Infection

Case

A 33-year-old woman underwent a physical examination at the Department of Gynecology and was found to have uterine fibroids. She was admitted for laparoscopic removal of the uterine fibroids under general anesthesia. During the operation, there was a small amount of dark red ascites in the pelvic cavity, a part of the intestine was densely adhered to the right pelvic wall, and the uterus was enlarged to the size of 10 weeks gestation, with an uneven surface. There was a fibroid tumor measuring approximately 7 × 8 × 8 cm on the posterior wall of the uterus, which was hard with clear boundaries. Two vesicular clear-fluid cysts with a diameter of 1-1.5 cm were seen on each fallopian tube. Due to the large posterior wall myoma and difficulty in suturing, the patient was considered barren; hence, abdominal myomectomy and pelvic adhesiolysis were selected, followed by indwelling catheterization. On the first day after surgery, the patient felt cold and was shivering, with a temperature of 38.5°C and lower abdominal pain. There was no sign of infection in the abdominal incision. When the indwelling catheter was removed, there was no urethral inflammation observed and the patient was able to urinate without difficulty. Blood was immediately drawn for culture and biochemical tests, which revealed low levels of sodium, calcium, and magnesium, and abnormal coagulation function. The level of original calcitonin was normal. The blood culture was positive after 15.3 hours in a nutrient solution for gram-negative bacilli. A diagnosis of sepsis was made based on the clinical features and laboratory values. Gram staining revealed short Gram-negative bacilli (Figure 1A). The blood culture plate showed gray and white colonies with good growth (Figure 1B). The chocolate culture plate showed poor growth (Figure 1C), while the MacConkey plate did not show any organism growth. (Figure 1D).

(Figure1A) Gram staining (1,000×) of *Acinetobacter schindleri* showing short, straight Gram-negative bacilli. (Figure1B) Good growth of gray and white colonies after culture on Columbia agar with 5% sheep's blood after 48 h of incubation. (Figure1C) Poor growth of gray and white colonies after culture on chocolate agar after 48 h of incubation. (Figure1D) No growth after culture on MacConkey agar. As bacterial identification was not possible with the VITEK II automatic bacterial analyzer (BioMerieux, Craponne, France), the VITEK-MS mass spectrometer (BioMerieux) was used to identify the bacteria as *Acinetobacter schindleri*. The results of the drug sensitivity testing for *A. schindleri*, based on the American Society for Clinical Laboratory Standardization (2017), were as follows: amoxicillin/papaulic acid 2 μg/ml, amikacin 2 μg/ml, ciprofloxacin 0.25 μg/ml, cefoperazone/sulbactam 34 μg/ml, cefepime 1 μg/ml, gentamicin 1 μg/ml, imipenem 1 μg/ml, levofloxacin 0.25 μg/ml, minocycline 28 μg/ml, sulfamethoxazole 20

μg/ml, tigecycline 0.5 μg/ml, tobramycin 1 μg/ml, and piperacillin/tazobactam 4 μg/ml. *A. schindleri* was resistant to amoxicillin/papaulic acid and sensitive to all others. In addition, 16SrRNA was used to identify the bacteria, and the sequence comparison analysis results were *A. schindleri* (NR025412.1) 99.22% and *Acinetobacter haemolyticus* (NR117622.1) 97.59%. The patient responded well to cefoperazone/sulbactam and metronidazole antibiotic treatment. After 5 days of treatment, the patient had normal body temperature, improved symptoms, and negative blood cultures; she was discharged two weeks later.

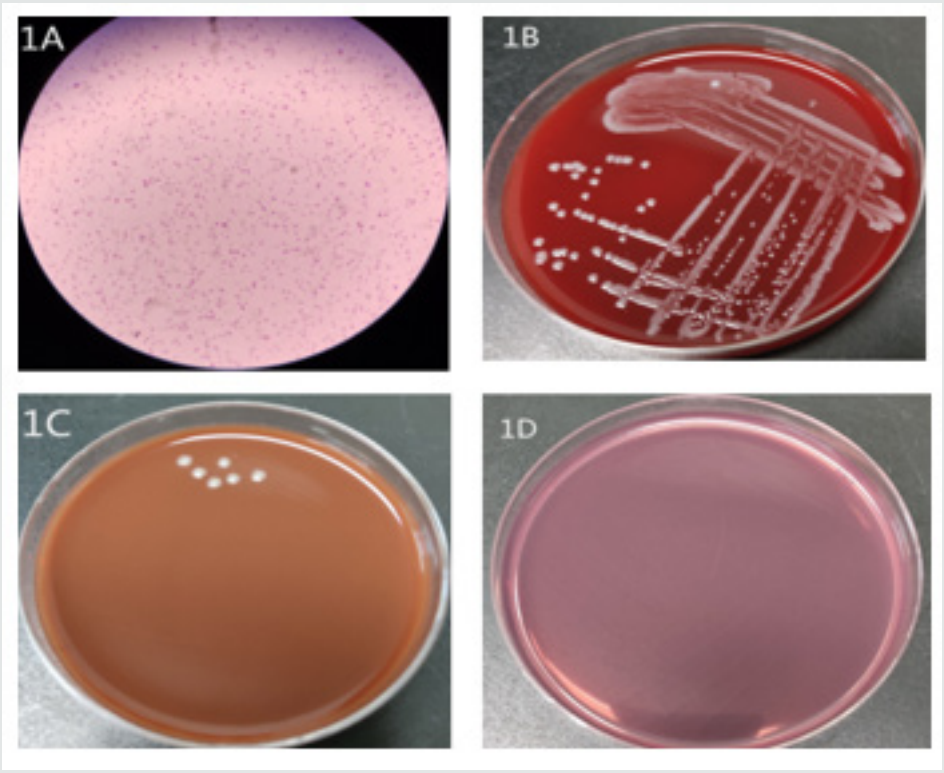

Figure 1: (1A) Gram staining (1,000×) of Acinetobacter schindleri showing short, straight Gram-negative bacilli. (1B) Good growth of gray and white colonies after culture on Columbia agar with 5% sheep's blood after 48 h of incubation. (1C) Poor growth of gray and white colonies after culture on chocolate agar after 48 h of incubation. (1D) No growth after culture on MacConkey agar.

Discussion

A. schindleri was first reported in [1]. *A. schindleri* is a non-motile, aerobic, gram-negative bacterium that can grow on dry surfaces for a long time [2] and exist in a wide range of natural environments, such as soil and water, as well as in hospitals [3]. The strains can be isolated from body surfaces of patients, and their presence in patient specimens (vagina, cervix, throat, nasal cavity, or urine) is usually clinically insignificant [1]. In 2012, a case was reported of *A. schindleri* carrying bla-NDM-1 found in the groin area of a 22-year-old man who had suffered an explosion injury during the war in Afghanistan; however, the clinical significance of this finding was not mentioned [4]. Studies have found that 80% of cases of catheter-related bacteremia show growth of *A. schindleri* in blood cultures; the endovascular device acts as a portal for *A. schindleri* blood infection [2]. *A. schindleri* is a gram-negative opportunistic pathogen that is prevalent in intensive care units and affects immunocompromised patients, thus leading to nosocomial infections and global outbreaks [5]. Compared with laparoscopic hysterectomy, traditional open myomectomy can reduce the blood supply to the anastomotic branches of the uterine and ovarian arteries causing poor local uterine blood circulation and increased vascular permeability, which can cause the bacteria to colonize the uterus and invade the bloodstream [6]. Due to the complex anatomical structure of the pelvic cavity and the large surgical wound, open surgery can easily cause body injury and immune suppression; the surgical process also increases the probability of opportunistic pathogen invasion. The patient had a history of human papillomavirus infection, a high-risk factor for cervical cancer.

The occurrence of tumor development is closely related to the body's immune function; when there is progressive tumor growth, immune function is restrained. Therefore, in cases such as large trauma surgery, severe postoperative complications in patients with all the above factors can cause low immunity, leading to opportunistic pathogens like *A. schindleri* infection. The only microorganism isolated from the blood culture of our patient

was *A. schindleri*, indicating that it was the pathogen causing the patient's postoperative sepsis. Blood culture remains the gold standard for the diagnosis of sepsis. Since 1986, the classification of Acinetobacter has undergone extensive revisions, with the discovery of a wide variety of species; however, studies have found that it is impossible to identify specific species of Acinetobacter by phenotype [2]. *A. schindleri* can be identified by a VITEK - MS spectrometer. However, clinical microbiology laboratories should be aware that while *A. schindleri* grows well in blood culture plates, it grows poorly in chocolate culture plates, and not at all in MacConkey plates. The risk factors for *Acitenobacter* infection are low immunity, underlying health conditions, and a history of human papillomavirus infection. Clinical attention should be paid to the implementation of active perioperative nursing care, strict aseptic operation, and reduction of postoperative nosocomial infections.

References

1. Nemec A, Dijkshoorn L, Jezek P (2000) Recognition of Two Novel Phenons of the Genus Acinetobacter Among Non-Glucose-Acidifying Isolates from Human Specimens. Journal of Clinical Microbiology 38(11): 3937-3941.
2. Dortet L, Legrand P, Soussy CJ, Cattoir V (2006) Bacterial Identification, Clinical Significance, and Antimicrobial Susceptibilities of *Acinetobacter Ursingii* and *Acinetobacter Schindleri*, Two Frequently Misidentified Opportunistic Pathogens. Journal of Clinical Microbiology 44(12): 4471-4478.
3. Bergogne-Bérézin E, Towner KJ (1996) *Acinetobacter spp*. as Nosocomial Pathogens: Microbiological, Clinical, and Epidemiological Features. Clinical Microbiology Reviews 9(2): 148-165.
4. McGann P, Milillo M, Clifford RJ, Snesrud E, Stevenson L, et al. (2013) Detection of New Delhi Metallo-β-lactamase (encoded by blaNDM-1) in *Acinetobacter Schindleri* During Routine Surveillance. Journal of Clinical Microbiology 51(6): 1942-1944.
5. Forster DH, Daschner FD (1998) Acinetobacter species as Nosocomial Pathogens. European Journal of Clinical Microbiology & Infectious Diseases: Official Publication of the European Society of Clinical Microbiology 17(2): 73-77.
6. Tian Y, Chen J (2021) The Effects of La paroscopic Myomectomy and Open Surgery on Uterine Myoma Patients Postoperative Immuno-Inflammatory Responses Endocrine Statuses and Prognoses: A Comparative Study. American Journal of Translational Researc 13(8): 9671-9678.

DOI: 10.32474/CTBM.2021.02.000142