Raoultella planticola, a central venous line exit site infection

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Abstract

Raoultella planticola is a Gram negative, aerobic, non-motile bacilli primarily considered to be environmental bacteria. It is a rare cause of human infections. We report a case of central catheter line exit site wound infection in a 15-month-old baby girl who was admitted electively for closure of ileostomy and incisional hernia repair. We identify the organism as R. planticola using Vitek2 biochemical identification system with a 99% probability. The patient was already on ampicillin, gentamicin and metronidazole started preoperatively and the central catheter was removed. Apparently the infection was eradicated by removal of the catheter and the effect of gentamicin, and the patient did not require changing the antibiotic or using other local antibiotic.

Keywords: Central catheter line exit site infection; Raoultella planticola

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Introduction

Raoultella planticola is an aquatic, botanical and soil organism that does not typically cause invasive infections in humans. This organism and Raoultella ornithinolytica produce histidine decarboxylase and have been implicated in scombroid (histamine) fish poisoning, but the clinical significance of this organism in humans has not been characterized. R. planticola was included in the genus Klebsiella until the late 1990s. It was first described as Klebsiella planticola in 1981 and as Klebsiella trevisanii in 1983. In 1986, the two organisms were placed in
the same species because of their extensive DNA sequence similarity; however, on the basis of the 16S rRNA gene and rpoB sequence analysis, the new genus Raoultella was created, and the name *R. planticola* was proposed to accommodate *K. planticola*. The first case of human infection with this organism was reported in 1984 in a patient with sepsis admitted to an intensive care unit in France. In 1986, two other cases were reported, the first a bloodstream infection after mitral valve replacement for infective endocarditis and the second a case of bacteraemic pneumonia after coronary artery graft surgery. A survey of newborns in a neonatal ward in Germany over 1 year showed that 72% of *Klebsiella* species were *Klebsiella oxytoca* and 8.7% were *K. planticola* recovered from oropharyngeal and rectal swab specimens. Alves et al. reported a case of severe pancreatitis complicated by *R. planticola* infection. Two strains of *R. planticola* showing resistance to carbapenem were recovered from patients hospitalized in the USA. One had been admitted for pneumonia and bacteraemia, while the other was known to have pre-acute B-lymphoblastic leukaemia. Unfortunately, both patients died even after the antibiotics were changed. These strains harbored *blaKPC-2* and *blaKPC-3*. In 2010, Wolcott et al. described a case of polymicrobial surgical site infection primarily due to *R. planticola* in a male patient with a fractured left tibia who had an open reduction internal fixation of his left ankle; he was treated with ertapenem. Recent case reports include a rare case of serious soft tissue infection in the thumb of a young male and a case of cholecystitis caused by *R. planticola* in a 62-year-old woman. Kim et al. reported the first case of necrotizing fasciitis involving the chest and abdominal wall caused by *R. planticola*.

Three cases of cholangitis associated with *R. planticola* infection were reported in 2012, all in immunocompromised patients who underwent procedural intervention with endoscopic retrograde cholangiopancreatography. A novel case of *R. planticola* urinary tract infection was reported as a first case of cystitis. Gastroenteritis developed in a patient who ate undercooked fish (sole), and *R. planticola* bacteremia was reported.

We report a case of central line exit wound infection caused by *R. planticola*. To our knowledge, this is the first reported case of human infection with this organism in Saudi Arabia.

**Case report**

A girl born at King Abdul-Aziz Medical City, Jeddah, at 35 weeks' gestational age was found by ultrasound to have an intestinal obstruction in utero. Examination after birth revealed a distended abdomen with bilious vomiting and intestinal obstruction, and abdominal ultrasound showed a complex cystic mass in the abdomen. She underwent laparotomy and peritoneal lavage with excision of the mass, which was confirmed to be a meconium cyst. Post-operatively, she developed a complicated meconium ileus and peritonitis, which required ileostomy. She was discharged home in a good condition with regular follow-up in the clinic and grew well during the neonatal period.

At 15 months, she was admitted electively for closure of the ileostomy and incisional hernia repair in February 2013. On admission, her temperature was 36.8 °C, her respiratory rate 33/min, her blood pressure 90/49 mmHg, her pulse rate 110/min, her body weight 7.56 kg and her height 65 cm. An internal jugular line was inserted in the operating room, and she was started on ampicillin, gentamicin, and metronidazole. On day 6 postoperatively, she had two spikes of fever of 38.9 °C and was found to have pus at the exit site of the central line. Septic screening was done, the central line was removed, and the exit site was cleaned aseptically. Investigations showed a negative blood culture, but a swab from the exit site showed *R. planticola* with 99% probability in the Vitek2 biochemical identification system.

No other organisms were isolated from cultures at other sites. The organism was resistant to ampicillin, piperacillin and trimethoprim/sulfamethoxazole but sensitive to amoxicillin and clavulanic acid, piperacillin and tazobactam, cefalotin, cefazolin, cefuroxime axetil, cefuroxime, cefpodoxime, cefotaxime, ceftazidim, cefepime, meropenem, amikacin, gentamicin, tobramycin and ciprofloxacin. The patient completed a 10-day course of ampicillin, gentamicin and

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metronidazole and required no further treatment for this infection. She was discharged home in good general condition. At follow-up in the outpatient clinic, the exit site of central line was clean, with complete healing.

Discussion

The patient in this case report experienced an exit site infection of the central catheter line caused by *R. planticola*, isolated by culture. The organism was identified by Vitek2 with 99% probability. The infection was probably eradicated by removal of the catheter and the effect of gentamicin and did not require changing the antibiotic or using a local antibiotic. As the child was already on ampicillin, gentamicin and metronidazole, which were started on the day of surgical repair of the hernia and closure of the ileostomy, we decided to continue the same antibiotics and to remove the central line, with close observation and aseptic cleaning of the site. With clinical improvement and good healing at the wound site, the child was discharged with follow-up.

Table 1 summarizes all the reported cases and outcomes of *R. planticola* infections in humans. The source of the organism in our patient might have contaminated infant formula or environmental sources, such as earth or water, but the origin was not studied.

Conclusion

*R. planticola* has been identified on a few occasions as the cause of human infection. It has been reported to be present in clinical specimens and should be suspected in immunocompromised patients and after procedural interventions. As this organism can cause significant comorbidity, it must be correctly identified and its susceptibility tested to guide antimicrobial therapy and improve outcome.

Ethics of publishing

The approval of the parents of the child for publication was obtained.

Conflict of interest

None declared.

References