Clinical Case Report

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Unusual case of rapid growing intraabdominal abscess caused by *Stenotrophomonas maltophilia* after laparoscopic appendectomy due to perforated appendicitis

A case report

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Abstract

Introduction: An intraabdominal abscess due to *Stenotrophomonas maltophilia (S maltophilia)* infection is a very rare clinical manifestation. *S maltophilia* is a glucose nonfermentative, aerobic, gram-negative, mobile, and biofilm-forming bacterium. It is an opportunistic pathogen and uncommon cause of infection. Respiratory tract infections (pneumonia) and bloodstream infections (bacteremia) are the most common clinical manifestations of *S maltophilia* infection.

Conclusions: This case report describes an unusual case of a rapidly growing, extremely large intraabdominal abscess (within 1 week during antibiotic therapy), which was detected 2 weeks after a laparoscopic appendectomy was performed for perforated appendicitis and was caused by multidrug-resistant *S maltophilia* infection.

Abbreviations: CT = computed tomography, IV = intravenous.

Keywords: abdominal abscess, stenotrophomonas maltophilia, surgery

1. Introduction

Stenotrophomonas maltophilia (*S maltophilia*) is a glucose nonfermentative, aerobic, gram-negative, mobile, and biofilm-forming bacterium.[1] The World Health Organization recently classified *S maltophilia* as one of the leading multidrug-resistant organisms in hospital settings.[2] *S maltophilia* is generally regarded as an organism of low virulence and an opportunistic pathogen, especially in immunocompromised hosts. The infection rate of *S maltophilia* is very rare, with reported prevalence rates of *S maltophilia* in the general population ranging from 1.3% to 1.68%.[3] Respiratory tract infections (pneumonia) and bloodstream infections (bacteremia) are the most common clinical manifestations of *S maltophilia* infection.[1,4] Less common manifestations are urinary tract infections, biliary tract infections, bone and joint infections, skin and soft tissue infections, peritonitis, wound infection, endopthalmitis, meningitis, and endocarditis.[1,4] Predisposing factors of *S maltophilia* infection are well known and include indwelling catheters (central venous catheters and urinary or biliary catheters) mechanical ventilation, recent surgery, malignancies (especially hematological malignancy), intensive care unit admission, organ transplantation, corticosteroids or immunosuppressive drugs, neutropenia, and prior antibiotic use.[5] The formation of an intraabdominal abscess due to *S maltophilia* infection is a very rare clinical manifestation. The rapid growth (within 1 week) of an extremely large intraabdominal abscess caused by *S maltophilia* infection after laparoscopic appendectomy due to perforated appendicitis is very unusual.

2. Case report

A 14-year-old boy presented with a 3 days history of intermittent abdominal pain and fever. He had undergone laparoscopic appendectomy due to perforated appendicitis 2 weeks earlier at the same hospital (Fig. 1). He also had a history of autism spectrum disorder and had been receiving medication therapy for the previous 3 years. Two weeks after being discharged in good condition, he visited the emergency center due to abdominal pain and fever. Laboratory tests revealed a white blood cell count of 22,180 cells/mm^3, C-reactive protein level of 23.35 mg/dL (reference range, 0–0.5 mg/dL), and hemoglobin count of 12.4 g/dL. Other laboratory findings revealed nothing of note. The clinical symptoms were fever (38.6°C) and mild abdominal pain. An abdominal pelvic computed tomography (CT) scan revealed small sized abscess (2–3 cm) formation in the ileocolic area (Fig. 2). The patient was admitted to the hospital, and antibiotic therapy was administered intravenously for 1 week. The intravenous (IV) antibiotics were a 4.5 g/vial of tazobactam

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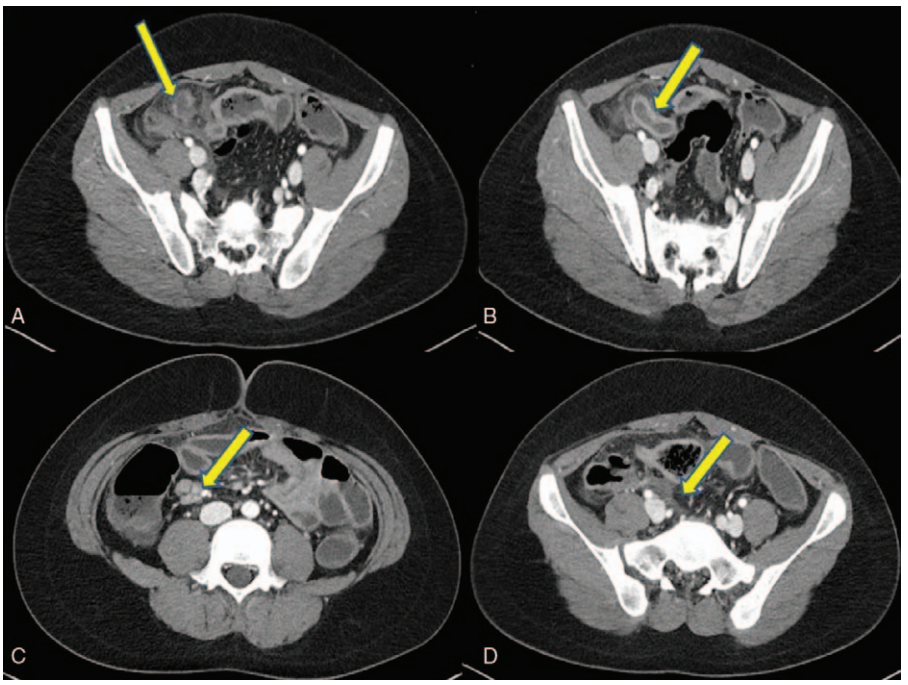

Figure 1. Initial computed tomography finding: (A, B) acute appendicitis, (C) enlarged lymph node at ileocolic area, and (D) fluid collection at ileocolic area.

(0.5 g) and piperacillin sodium (4 g), administered every 6 hours and metronidazole (500 mg/100 mL/bt), administered every 8 hours. After 1 week of antibiotic treatment for small sized abscess pocket, a follow-up CT scan revealed that the initial small sized abscess in the ileocolic area was smaller. However, newly developed extremely large abscess (about 7–8 cm) formation was present along the right anterior pararenal space and subhepatic space (Fig. 3). An emergency exploratory laparotomy was performed for abscess drainage and checking the leakage of appendectomy site. The intraoperative finding was a small abscess pocket (1–2 cm) in the ileocolic area near the cecum. The appendectomy site was normal, with no specific findings or leakage. However, a huge abscess pocket was located between the liver bed, transverse colon, and stomach. This abscess pocket showed severe adhesion to the liver bed, transverse colon, stomach, and omentum (Fig. 4). The abscess in the ileocolic area was drained. However, the huge abscess pocket could not be eliminated due to its adhesion. Thus, it was ruptured using an electrocautery device, and a closed drain was then inserted. One week after the surgery, a follow-up CT scan showed that the huge abscess pocket was smaller but remained. A percutaneous drain catheter was inserted under ultrasonography guidance. Abscess drainage culture revealed many *S maltophilia*. The cultures from abscess were performed at intervals of 2 days. Results for all cultures were performed by automated systems (VITEK 2 microbial identification and antibiotic susceptibility [ID/AST] testing system; bioMérieux S.A. 69280 Marcy l'Etoile, France). IV trimethprim/sulfamethoxazole was added for 2 weeks. After 2 weeks, a follow-up CT scan showed a complete improvement, and the patient was discharged and recovered well.

3. Discussion

A retrospective study of 1817 patients reported that the incidence of intraabscess formation after 3-port laparoscopic appendectomy was 1.5%, and that the average interval from the time of the

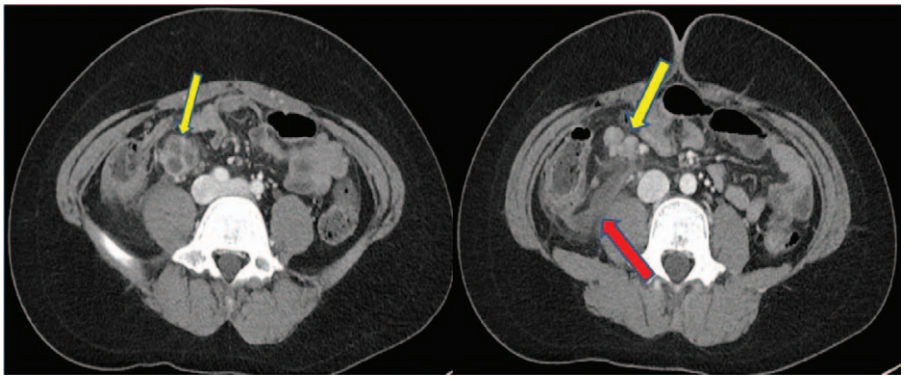

Figure 2. Computed tomography scan after 2 weeks later after laparoscopic appendectomy: (A) abscess pocket at ileocolic area, (B) enlarged lymph nodes (yellow arrow), fluid collection at ileocolic area (red arrow).

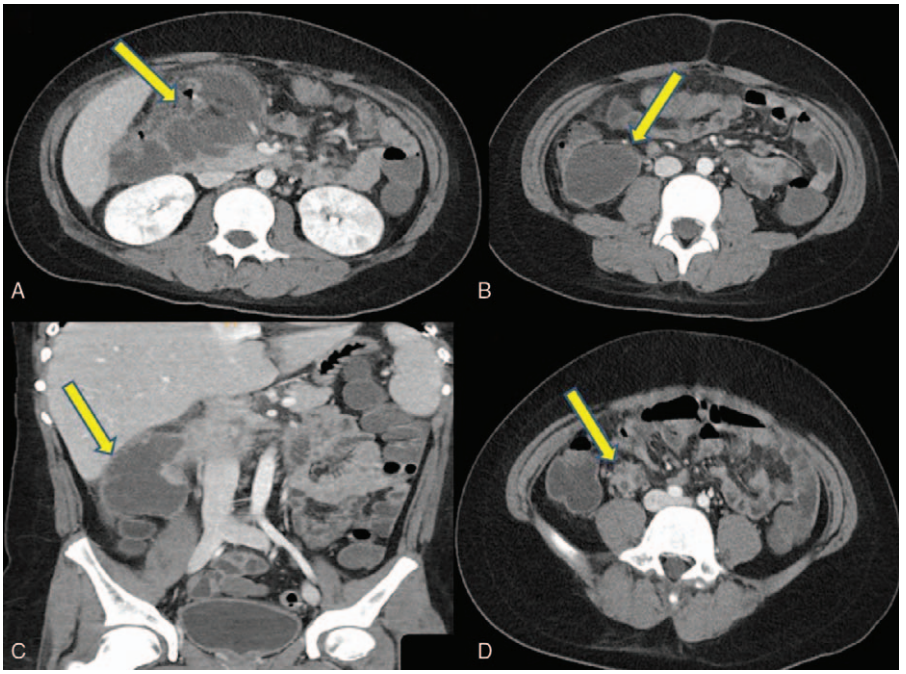

Figure 3. (A–C) Rapid growing abscess formation along with subhepatic area and right anterior pararenal space (arrow). (D) Initial abscess pocket at ileocolic area, changed smaller size (arrow).

laparoscopic appendectomy to the detection of the intra-abdominal abscess was 12.9 days.[6] The same study reported that the risk factors for intraabdominal abscess formation after laparoscopic appendectomy were peritoneal irrigation and nonplacement of a peritoneal drain.[6] In the present case, peritoneal irrigation (about 100cc) was performed during the laparoscopic appendectomy, and a peritoneal drain was inserted. In the present case, a small intraabdominal abscess was detected in the ileocecum area 2 weeks after the laparoscopic appendectomy was performed for perforated appendicitis. Interestingly, despite antibiotics therapy, a huge intraabdominal abscess formed after admission for treatment of the small abscess in the ileocecum area.

S maltophilia is not considered highly virulent. It mainly causes hospital-acquired infections, particularly in immunocompromised patients. However, *S maltophilia* infections have increased because of the intrinsic multiple-drug resistance of microorganisms, including resistance to b-lactams, amioglycosides, nosocomial colonization of microorganisms, and their opportunistically pathogenic nature.[7] The treatment of *S maltophilia* infection is difficult because of the bacterium's inherent resistance to a variety of antibiotics.[7] The treatment of choice for *S maltophilia* is trimethoprim/sulfamethoxazole, and fluoroquinolone is the proposed alternative. Trimethoprim/sulfamethoxazole remains the most effective antimicrobial agent against *S maltophilia*, with an overall susceptibility rate higher than 90%.[8] There are limited antimicrobial treatment options for infections due to *S maltophilia* because of its extensive resistance to most antibiotics, including b-lactam antibiotics, macrolides, and aminoglycosides.

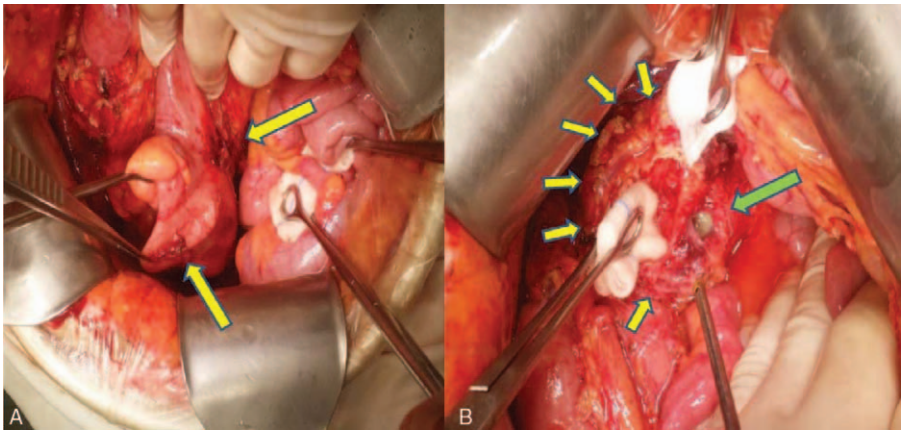

Figure 4. (A) The appendectomy site was normal (left arrow), a site of located initial abscess pocket at ileocolic area (right arrow). (B) Abscess formation with severe adhesion (yellow arrow), abscess pocket was ruptured by electrocautery device (green arrow).

It remains susceptible to ticarcillin/clavulanate, ceftazidime, minocycline, levofloxacin, trimethoprim/sulfamethoxazole, and chloramphenicol.[8] The patient in the present case developed a new abscess during IV antibiotics therapy (tazobactam 0.5 g, piperacillin sodium 4 g, and metronidazole 500 mg/100 mL) for 1 week. Following IV therapy with trimethoprim/sulfamethoxazole for 2 weeks, the patient made a full recovery. *S maltophilia* is associated with high morbidity and mortality, ranging from 21% to 69%.[9] According to previous research, the risk factors for mortality in patients with *S maltophilia* bacteremia were sepsis-related organ-failure assessment scores and removal of the central venous catheter, as shown by a multivariate analysis.[10]

Three aspects of the present case make it unusual. First, the huge intraabdominal abscess developed during IV antibiotics therapy for a small intraabdominal abscess at another site. Second, the formation of the extremely large intraabdominal abscess was very rapid (within 1 week). Third, the culture from abscess fluid revealed *S maltophilia*. The formation of an intraabdominal abscess is a very rare and unusual clinical feature among the clinical manifestations of *S maltophilia* infection. The causes of the presence of *S maltophilia* are unclear at present case. This case presents possibilities that *S maltophilia* colonizes the gastrointestinal tract as the gastrointestinal tract would be the most likely source for a postappendectomy intraabdominal abscess.

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