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Intraabdominal abscess caused by *Stenotrophomonas maltophilia*: A case report



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ABSTRACT

INTRODUCTION: *Stenotrophomonas maltophilia* usually causes nosocomial infections, but intraabdominal abscesses or organ/space surgical site infection (SSI) secondary to this organism has been rarely reported. Here, we reported a rare case of SSI that presented as intraabdominal abscess caused by *S. maltophilia*.

PRESENTATION OF CASE: A 68-year-old woman presented to our hospital with transverse colon cancer. Further work up with abdominal computed tomography (CT) revealed left renal cell carcinoma. Transverse colon resection and left kidney partial resection were performed. On post-operative day 10, she started to have fever at 38 °C and repeat abdominal CT showed intraabdominal abscess. Empiric treatment with piperacillin/tazobactam (TAZ/PIPC) was initiated. However, fever persisted and the abscess size did not change despite 10 days of antibiotic. On post-operative day 20, drainage of intraabdominal abscess was performed. TAZ/PIPC was then shifted to meropenem (MEPM). After two days, *S. maltophilia* was identified in the culture of the abscess, and MEPM was shifted to minocycline (MINO). Fever disappeared after 7 days of treatment and abdominal CT after 14 days showed almost complete resolution of the abscess.

DISCUSSION: *S. maltophilia* is a multi-drug resistant, aerobic, non-glucose fermenting, non-sporulating, Gram-negative bacillus. *S. maltophilia* may cause a variety of infections, but intraabdominal abscesses as a manifestation of SSI due to this organism is relative rare.

CONCLUSION: Although usually a non-pathogenic organism or colonizer, *S. maltophilia* can cause organ/space SSI in an immunocompromised host. Therefore, clinicians should be aware of the possibility that *S. maltophilia* may cause organ/space SSI.

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1. Introduction

Surgical site infections (SSI) after colon or urogenital operations are most often caused by enterobacteriaceae and anaerobes but may rarely be caused other organisms [1]. *Stenotrophomonas maltophilia*, formerly known as *Pseudomonas* or *Xanthomonas maltophilia*, is an aerobic Gram-negative bacillus that has, in recent years, rapidly increased in clinical importance as a significant nosocomial pathogen, particularly in immunocompromised patients [2]. *S. maltophilia* has been isolated from various hospital sources [3] and cross-infections with the organism have been reported [4]. Although a variety of infections associated with *S. maltophilia* have been reported, SSIs presenting as intraabdominal abscesses due to this organism were rarely reported. Herein, we report a rare case of SSI that presented as an intraabdominal abscess caused by *S. mal-*

tophilia. This case report has been reported in line with the SCARE criteria [5].

2. Presentation of case

A 68-year-old woman presented to our hospital for management of transverse colon cancer. Her general condition was good; she had no abdominal pain, nausea, appetite loss, constipation, or diarrhea. She did not have a past history of diabetes mellitus, chronic respiratory disease, use of broad-spectrum antibiotics, and long-term hospitalization. Her family history was unremarkable. Physical examination revealed a heart rate of 84 beats/min, blood pressure of 137/87 mmHg, respiratory rate of 20 breaths/min, temperature of 36.6 °C, and oxygen saturation of 99% at room air. Abdominal examination was unremarkable. Abdominal computed tomography (CT) showed mucosal wall thickness and nodular shadow on the transverse colon (Fig. 1) and a 22 mm hypodense solid mass on the left kidney (Fig. 2). White blood cell count and C-reactive protein were 3000/μl and 0.08 mg/dl, respectively. Serum carcinoembryonic antigen and carbohydrate antigen 19–9 were

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Fig. 1. Abdominal computed tomography showed mucosal wall thickness on the transverse colon.

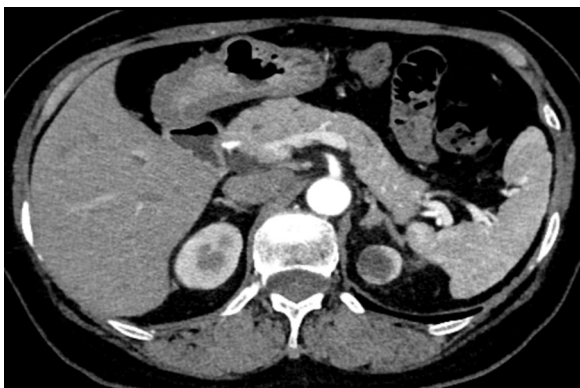


Fig. 2. Abdominal computed tomography showed a 22 mm hypodense solid mass on the left kidney.



Fig. 3. Abdominal computed tomography showed intra-abdominal abscess in the left perinephric space.

1.0 ng/ml and 4.3 U/mL, respectively. Test for human immunodeficiency virus infection was negative. On hospital day 2, transverse colon resection and left kidney partial resection were performed. Histologic examination showed moderately differentiated adenocarcinoma of the transverse colon tumor and clear cell carcinoma of the left renal tumor. On post-operative day 10, she started to have fever at 38 °C; repeat abdominal CT showed intra-abdominal abscess (Fig. 3). With an impression of SSI and pending identification of the causative bacteria, empiric treatment with piperacillin/tazobactam (TAZ/PIPC) 4.5 g intravenously every 8 h was initiated. However, after 10 days of treatment, fever persisted and the size of the abscess did not change. On post-operative day 20, she required insertion of a pigtail catheter to drain, drainage of



Fig. 4. Abdominal computed tomography after 14 days showed almost complete resolution of the abscess.

the intraabdominal abscess was performed; Gram stain revealed many neutrophils, but it was negative for bacteria. TAZ/PIPC was then shifted to meropenem (MEPM) 1.5 g intravenously every 8 h. After 2 days culture of the abscess showed *S. maltophilia* sensitive to sulfamethoxazole-trimethoprim (TMP-SMX), minocycline (MINO), and levofloxacin (LVFX). MEPM was then shifted to MINO 100 mg intravenously every 12 h. After 7 days of treatment, fever disappeared and abdominal CT after 14 days showed almost complete resolution of the abscess (Fig. 4). Therefore, the pigtail catheter was removed. After 2 weeks, MINO was shifted to LVFX 500 mg oral every 24 h. LVFX was continued for 2 weeks, and the patient was discharged. On follow-up, she had remained asymptomatic with no recurrence.

3. Discussion

S. maltophilia is a multi-drug resistant, aerobic, non-glucose fermenting, non-sporulating, Gram-negative bacillus. In 1960, Hugh and Ryschenkow applied the name *Pseudomonas maltophilia* to this new species of pseudomonas [6]. This organism is primarily an aerobic plant pathogen that is also isolated in soil and water. Although *S. maltophilia* is considered a pathogen with low virulence, it has been increasingly reported as a nosocomial pathogen responsible for serious infectious complications in immunocompromised hosts. *S. maltophilia* may cause a variety of infections, such as pneumonia, bacteremia, urinary tract infection, ocular infection, skin or soft tissue infection, endocarditis, peritonitis, cholecystitis, and meningitis [7,8], but reports on organ/space SSI due to this organism have been few. Moreover, intraabdominal abscesses as a manifestation of SSI due to this organism is relative rare. Vaidyanathan et al. reported a case of perinephric abscess caused by *S. maltophilia* after nephrostomy, but their case was a superinfection after one month of *Proteus mirabilis* infection [9]. In that case, the intraabdominal space infection was secondary to an indwelling pigtail catheter and various antibiotics were administered for one month. On the other hand, our case was probably a primary infection by *S. maltophilia*.

The predisposing factors for *S. maltophilia* infection are malignancy, transplant recipients, cytotoxic therapy, chronic respiratory disease, indwelling urinary catheter, breakdown of mucocutaneous defense barriers, neutropenia, intensive care unit stay, use of broad-spectrum antibiotics, and long-term hospitalization [10,11]. The possible predisposing factors in our patient were malignancy and breakdown of mucocutaneous defense barriers. Due to the absence of recent or long-term hospital admission and use of broad-spectrum antibiotics, she was unlikely to be a carrier of *S. maltophilia*. Because the surgical operations were performed on the day after admission, infection with *S. maltophilia* may have happened during operation. Until the isolation of *S. maltophilia* in this

patient, no other patients in the ward or in the operating room where she stayed at harbored this organism. A previous large-scale surveillance study on reported that *S. maltophilia* was the third most frequently isolated non-fermentative, Gram-negative bacillus after *Pseudomonas aeruginosa* and *Acinetobacter* spp. [12]. Therefore, clinicians should be aware that *S. maltophilia* may spread elsewhere in the hospital environment, especially from water-related sources and devices used for patient care.

Because *S. maltophilia* is usually a non-pathogenic organism or colonizer, it is generally not initially suspected as causative bacterium. Distinguishing between colonization and infection due to this organism is difficult. In our case, a diagnosis of SSI due to *S. maltophilia* was relatively easy because it was isolated from the sample from the intraabdominal abscess.

Management of *S. maltophilia* infection may be problematic because of its high intrinsic or acquired resistance to multiple broad-spectrum antibiotics due to various mechanisms. β -lactam agents such as penicillins, cephalosporins, and carbapenems are generally agreed to exhibit poor activity against *S. maltophilia*. TMP-SMX has been considered the first-line treatment for *S. maltophilia* infections, based on *in vitro* susceptibility rates [13,14], rather than clinical studies. Tetracyclines are considered to be second-line agents and fluoroquinolones are alternative options [11,12,15]. However, TMP-SMX-resistant strains have been increasingly reported [16,17] and the TMP-SMX intolerance or allergic reactions are not uncommon. Hand et al. reported that treatment failure did not differ between TMP-SMX and MINO monotherapies for *S. maltophilia* infections [18]. Accordingly, we selected intravenous MINO and oral LVFX antibiotic therapy with drainage of the abscess and successfully treated this patient.

S. maltophilia is generally not initially suspected as a causative pathogen of intraabdominal abscesses as an SSI. However, this rare and antibiotic-resistant bacterial species should be considered a possible pathogen in patients who are unresponsive to broad-spectrum antibiotics for SSI, and appropriate antibiotics should be started immediately.

4. Conclusion

In conclusion, a rare case of intraabdominal abscess as an SSI caused by *S. maltophilia* was described. Clinicians should be aware of the possibility that *S. maltophilia* may cause organ/space SSI.

Conflict of interest

None.

Funding

None.

Ethical approval

Our ethics committee waived the requirement of ethics approval because all medical and laboratory procedures are routinely carried out and do not affect decisions concerning treatment.

Consent

Written informed consent was obtained from the patient's daughter for publication of this case report and any accompany-

ing images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request".

Author contributions

TS reviewed the literature. SY contributed to the collection of patient data. NM analyzed the radiologic findings. NS performed microbiological tests. TS was the main writer of the manuscript. HM moderated the manuscript.

Guarantor

Toyomitsu Sawai.

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