

CASE REPORT

A Rare Case of Intraperitoneal Infection by *Kodamaea ohmeri*

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SUMMARY

Background: In April 2024, our hospital confirmed a rare case of intra-abdominal infection by *Kodamaea ohmeri*. The patient sought medical attention at our hospital after taking painkillers orally for one month, experiencing recurrent abdominal pain for 17 days and worsening for 7 days. In March 2024, the patient received symptomatic treatment with oral analgesics (diclofenac sodium) for arthritis. After 2 weeks of medication, the patient experienced upper abdominal colic without any additional triggers. After 3 weeks of medication, the abdominal pain significantly worsened compared to before, and the pain was persistent. The patient continued to receive oral painkillers for treatment, but there was no significant improvement in symptoms. The patient went to another hospital for treatment with anti-inflammatory infusion (specific details unknown), but the effect was not satisfactory. In order to seek additional treatment, he is now seeking medical attention at our hospital.

Methods: Clinical implementation includes abdominal CT, exploratory laparotomy, repair of duodenal perforation, intestinal adhesiolysis, abdominal lavage, and pus drainage. The extracted pus was subjected to culture and identification, fungal fluorescence staining, acid fast staining, and Gram staining. Further related auxiliary examinations include blood routine, urine routine, liver function, kidney function, quantitative detection of myocardial injury, and B-type natriuretic peptide.

Results: Abdominal CT: Bilateral pleural effusion, free gas under the diaphragm and abdominal cavity, considering: 1. Gastrointestinal ulcer bleeding with perforation, 2. Acute peritonitis. Blood routine + CRP (venous blood): White blood cells $11.93 \times 10^9/L$, lymphocyte percentage 8.4%, neutrophil percentage 86.1%, whole blood high-sensitivity C-reactive protein 64.04 mg/L. Inflammatory markers: procalcitonin 55.890 ng/mL, interleukin-6 > 5,000.00 pg/mL. Myoglobin 261.6 µg/L, high-sensitivity troponin T 0.197 µg/L, B-type natriuretic peptide test (BNP): 67.06 pg/mL, liver function test: total protein 34.8 g/L, albumin 22.6 g/L, globulin 12.2 g/L, total bilirubin 27.0 µmol/L, direct bilirubin 17.9 µmol/L, aspartate aminotransferase 127.5 U/L, alanine aminotransferase 232.0 U/L, renal function test: urea 12.94 mmol/L, creatinine 175.30 µmol/L, D-dimer test 6452.47 FEU µg/L. Pus culture and identification (MALDI-TOF MS): *Kodamaea ohmeri*, fungal fluorescence staining: positive. Clinical treatment plan: fluconazole 0.2 g ivgtt qd, imipenem cilastatin 1 g ivgtt qd, esomeprazole 0.04 g ivgtt qd. Adjuvant therapy: fasting water, ventilator-assisted breathing, gastrointestinal decompression, acid suppression and stomach protection, analgesia and sedation, and fluid replacement. After 14 days of treatment, the patient's abdominal pain was significantly alleviated, inflammation indicators significantly decreased, and no further special discomfort was reported. The patient improved and was discharged.

Conclusions: This article reports a rare case of intraperitoneal infection by *Kodamaea ohmeri*. *Kodamaea ohmeri* was quickly and accurately identified by MALDI-TOF MS, and reasonable treatment measures were adopted clinically. The patient improved and was discharged. I hope that in the future, this study can provide assistance for the clinical diagnosis and treatment of *Kodamaea ohmeri* infection.

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KEYWORDS*Kodamaea ohmeri*, MALDI-TOF MS**CASE PRESENTATION****Case**

The patient, a 50-year-old male, presented to our hospital for treatment after taking oral painkillers for 1 month, recurrent abdominal pain for 17 days, and worsening for 7 days. In March 2024, the patient received symptomatic treatment with oral analgesics (diclofenac sodium) for arthritis. After taking the medication for 2 weeks, the patient experienced upper abdominal colic without any additional triggers. After taking the medication for 3 weeks, the abdominal pain significantly worsened compared to before, and the pain was persistent. The vomited stomach contents contained a slight amount of dark red blood, and the abdominal pain slightly improved after vomiting, accompanied by black stools. The patient continued to receive oral painkillers for treatment, but there was no significant improvement in symptoms. The patient went to another hospital for treatment with anti-inflammatory infusion (specific details unknown), but the treatment effect was not satisfactory. In order to seek additional treatment, he is now seeking medical attention at our hospital. Admission diagnosis: 1. Gastrointestinal perforation with bleeding, 2. Acute diffuse peritonitis, 3. Acute hemorrhagic anemia. After admission, clinical experience showed that cefoperazone sulbactam 3 g ivgtt qd was administered for anti-infection treatment. Abdominal CT, exploratory laparotomy, duodenal perforation repair, intestinal adhesiolysis, abdominal lavage, and pus drainage were performed. The extracted pus was subjected to culture and identification, fungal fluorescence staining, acid fast staining, and Gram staining. Additional related auxiliary examinations include blood routine, urine routine, liver function, kidney function, quantitative detection of myocardial injury, and B-type natriuretic peptide. Examination results: Abdominal CT: Bilateral pleural effusion, free gas in the diaphragm and abdominal cavity, suspected gastrointestinal ulcer bleeding with perforation and acute peritonitis. Blood routine + CRP (venous blood): White blood cells $11.93 \times 10^9/L$, lymphocyte percentage 8.4%, neutrophil percentage 86.1%, whole blood hypersensitive C-reactive protein 64.04 mg/L. Inflammatory markers: procalcitonin 55.890 ng/mL, interleukin-6 > 5,000.00 pg/mL. Myoglobin 261.6 µg/L, high-sensitivity troponin T 0.197 µg/L, B-type natriuretic peptide test (BNP): 67.06 pg/mL, liver function test: total protein 34.8 g/L, albumin 22.6 g/L, globulin 12.2 g/L, total bilirubin 27.0 µmol/L, direct bilirubin 17.9 µmol/L, aspartate aminotransferase 127.5 U/L, alanine aminotransferase 232.0 U/L, prealbumin 91.6 mg/L, renal function test: urea 12.94 mmol/L, creatinine 175.30 µmol/L, coagulation function: prothrombin time 119.0 U/L. 3s, fibrinogen detection 4.62 g/L, D-dimer detec-

tion 6,452.47 FEU µg/L. Pus culture and identification (MALDI-TOF MS): *Kodamaea ohmeri* (Figure A, C), fungal fluorescence staining: positive (Figure B). Clinical treatment plan: fluconazole 0.2 g ivgtt qd, imipenem cilastatin 1 g ivgtt qd, esomeprazole 0.04 g ivgtt qd. Adjuvant therapy: ventilator-assisted breathing, gastrointestinal decompression, acid suppression and stomach protection, analgesia and sedation, and fluid replacement. After 14 days of treatment, the abdominal wound dressing was correctly wrapped, without exudation, the abdomen was flat, no gastrointestinal or peristaltic waves were observed, and there was no significant tenderness in the entire abdomen. The inflammatory indicators significantly decreased, and the patient improved and was discharged. After discharge, the patient continued to be hospitalized in the local hospital for treatment, continued enteral and parenteral nutrition support, and gradually transitioned to total enteral nutrition.

DISCUSSION

Kodamaea ohmeri is a type of fungus belonging to the family Yeasts and the class Ascomycota [1]. It is widely used in the food industry and is seldom isolated clinically [2]. In 1948, this yeast was first isolated from pleural fluid specimens and was considered a contaminating yeast at the time [3]. This yeast infection is common in sepsis, urinary tract infection, peritonitis, endocarditis, cellulitis, oral ulcers, thrombophlebitis, skin onychomycosis, acute lymphocytic leukemia, and neonatal infections [4]. This article reports a rare case of intraperitoneal infection by *Kodamaea ohmeri*. The patient sought treatment at another hospital in the early stage, but the results were not satisfactory. Fortunately, a clear diagnosis was finally obtained here, and reasonable treatment measures were adopted clinically, resulting in an improvement in the condition.

Li Y et al. reported in their study [5] that prolonged-term hospitalization, tracheal intubation, mechanical ventilation, and the use of piperacillin and tazobactam may be associated with the infection of *Kodamaea ohmeri*. Usually, there is no significant correlation between surgery and this yeast infection. Various indwelling catheters and long-term infusion of intravenous nutrient fat emulsions are high-risk factors for infection with *Kodamaea ohmeri*, with weakened immune function. The use of hormones, antibiotics, and nonsteroidal anti-inflammatory drugs has become a trigger for fungal infection [6]. In this case, the patient has a history of using nonsteroidal anti-inflammatory drugs to treat arthritis, leading to an increased chance of infection. In this case, the patient underwent laparotomy for exploration, and pus was collected during surgery. After multiple examinations of the pus, the final diagnosis was made of *Omicrobacter* infection. Therefore, valuable specimens should be greatly valued in clinical practice, especially in deep and sterile specimens where the same yeast have been repeatedly isolated. In addition, a cautious at-

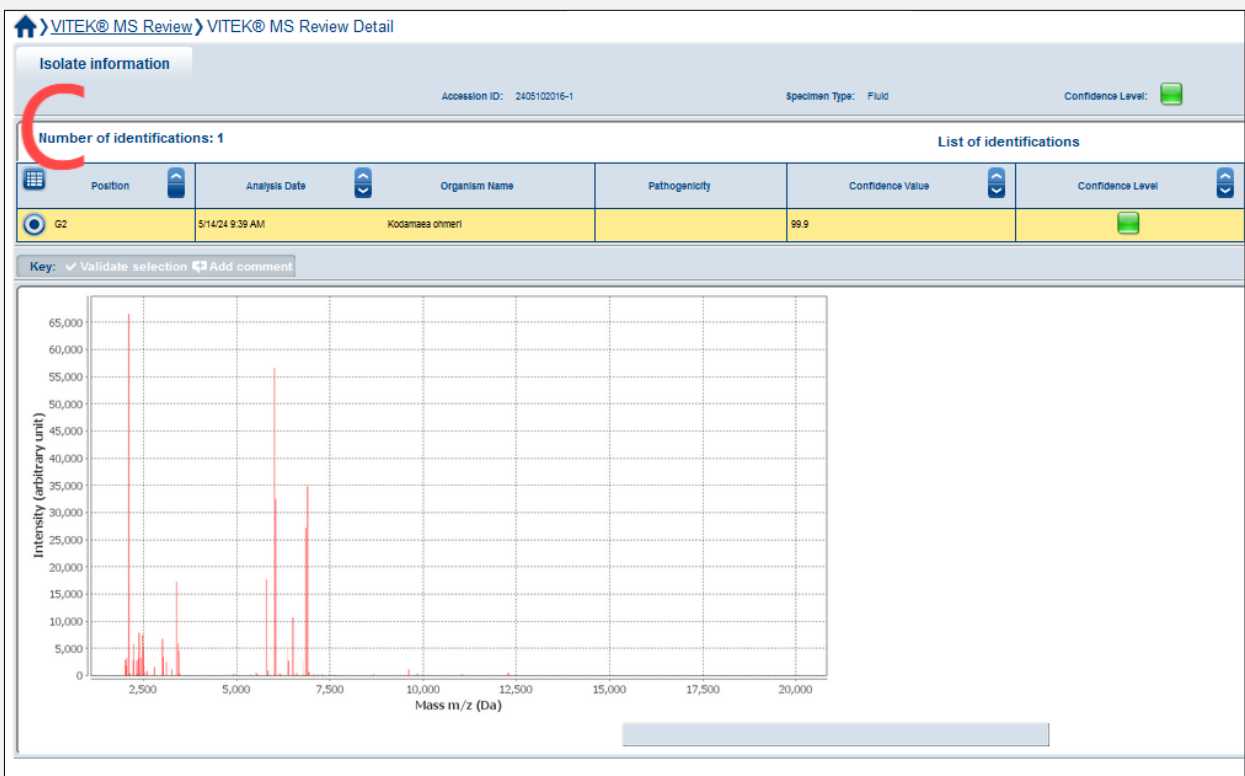
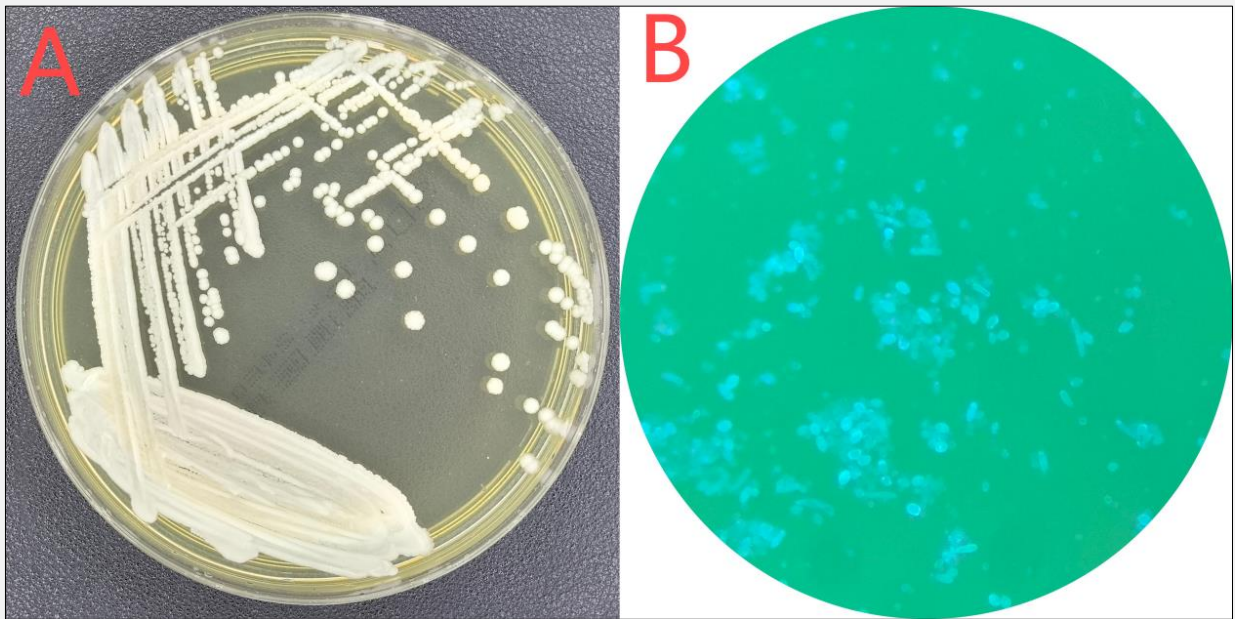


Figure A. Growth of *Kodamaea ohmeri* in sabouraud agar medium at 28°C, 96 hours, aerobic cultivation.
 Figure B. Fungal fluorescence staining x 1,000.
 Figure C. Identification results of *Kodamaea ohmeri* MALDI-TOF MS.

attitude should be taken when evaluating the pathogenic effects of yeast, and it is important to pay attention to the cooperation between the laboratory and clinical physicians.

At present, there is no consensus or guideline for the diagnosis and treatment of *Kodamaea ohmeri* infection. In the case report by Wilcock JN et al. [7], the main treatment options include removing foreign bodies from the patient's body and using effective antifungal drugs such as triazole, echinococcin, and amphotericin B monotherapy or combination therapy. Sathi FA et al. reported in relevant literature [8] that fluconazole is the most commonly used therapeutic drug, and combination therapy regimens (such as fluconazole combined with amphotericin B or actions or voriconazole) do not have better therapeutic effects in some patients than single administration. Azole antifungal drugs and echinocandin antifungal drugs can effectively inhibit fungal activity [9]. The selection of drugs is specific to different individuals, and there is no clear effective evidence. For patients with severe immunodeficiency, the use of antifungal drugs is not significantly related to cure [10]. Therefore, the optimal treatment plan for *Kodamaea ohmeri* infection still needs to be clarified. The patient in this case had recurrent fever before admission and was treated with multiple antibiotics outside the hospital, but the effect was not satisfactory. After admission, the patient's initial empirical treatment was cefoperazone sulbactam, which was adjusted to imipenem cilastatin after one week of treatment. However, the patient's temperature still rose repeatedly, and the treatment effect was not obvious. Finally, based on the results of pus culture, it was determined that after being infected by *Kodamaea ohmeri*, fluconazole treatment was given for 2 weeks. The patient's body temperature gradually returned to normal, and inflammation indicators significantly decreased. This antibacterial drug treatment achieved excellent results. For this patient, no adverse reactions were observed with fluconazole treatment. It is worth noting that in addition to treatment, attention should be paid to improving the patient's immune system and reducing the chance of concurrent infections. Therefore, clinical auxiliary treatments such as gastrointestinal decompression, acid suppression and stomach protection, analgesia and sedation, and fluid replacement should be carried out. For patients with weakened immune function, appropriate drugs should be selected during anti-infection treatment, with sufficient dosage and duration of treatment, in order to achieve better therapeutic effects [11].

In this case, *Kodamaea ohmeri* was quickly and accurately identified through MALDI-TOF MS, allowing the patient to receive timely medication treatment. MALDI-TOF MS is a rapid identification technology based on microbial characteristic protein fingerprinting. Compared with traditional microbial identification methods, it can complete the identification of microbial strains at the species level in a few minutes, and has advantages such as simplicity, speed, stability, high-

throughput, and cost-effectiveness [12]. This case demonstrates the important role of MALDI-TOF MS in clinical microbiology research.

In summary, this article reports a case of intraperitoneal infection by *Kodamaea ohmeri*. *Kodamaea ohmeri* that was quickly and accurately identified by MALDI-TOF MS, and reasonable treatment measures were adopted clinically. The patient improved and was discharged. We hope that in the future, this study can provide assistance for the clinical diagnosis and treatment of *Kodamaea ohmeri* infection.

Ethics Approval and Consent to Participate:

Ethical review and approval were not required for this study. The patient provided written informed consent to participate in this study.

Consent for Publication:

The patient provided written informed consent for study publication.

Availability of Data and Materials:

The original data and materials presented in the study are included in the article. Further inquiries can be directed to the corresponding author.

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Declaration of Interest:

The authors declare no competing interests.

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