

Candidemia after endoscopic retrograde cholangiopancreatography in an immunocompetent patient: A case report and literature review

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Abstract

Candidemia is a rare adverse event of endoscopic retrograde cholangiopancreatography (ERCP). To date, several case reports of post-ERCP candidemia have been reported. Recently, we experienced a case of disseminated candidemia caused by *Candida albicans* with secondary complications of acute respiratory distress syndrome, acute kidney injury, and hematogenous candidal endophthalmitis following ERCP in a young healthy patient without well-recognized risk factors for candidemia. After intravenous and intravitreal antifungal therapy and intensive care, the candidemia resolved, and the patient was discharged without further sequela. The present case alerted us to consider candidemia as a rare but potentially fatal adverse event of ERCP, even in an immunocompetent host.

Keywords: Adverse event, candidemia, endoscopic retrograde cholangiopancreatography

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INTRODUCTION

Candidemia following endoscopic retrograde cholangiopancreatography (ERCP) is a rare adverse event and has proven to be fatal.^[1-3] Particularly in immunocompetent and noncritically ill patients without risk factors for disseminated candidemia, post-ERCP candidemia is extremely rare, and to date, only one case of fatal candidemia in an immunocompetent patient caused by *Candida tropicalis* after ERCP has been reported.^[1] However, candidemia caused by *C. albicans* following ERCP has not yet been described. Here, we report a case of disseminated candidemia caused by *C. albicans* following ERCP in a young healthy male patient without risk factors for candidemia,

and we summarize the detailed features of previously reported cases of post-ERCP candidemia.

CASE REPORT

A 22-year-old man, previously healthy, was admitted to the emergency room with 1 day history of fever and right upper quadrant (RUQ) pain. His vital signs were as follows: blood pressure 110/79 mmHg, pulse rate 68 beats per minute, and body temperature 38.9°C. On physical examination, there was tenderness in the RUQ area and a positive Murphy's sign.

Laboratory examination revealed the following: white blood cell (WBC) count 9610 mm³; blood urea nitrogen

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7.6 mg/dL; creatinine 0.8 mg/dL; total bilirubin 2.27 mg/dL; direct bilirubin 1.96 mg/dL; aspartate aminotransferase 160 IU/L; alanine aminotransferase 287 IU/L; alkaline phosphatase 238 IU/L; gamma-glutamyl transferase 919 IU/L; C-reactive protein 1.6 mg/dL. Abdominal computed tomography (CT) and magnetic resonance cholangiopancreatography (MRCP) revealed diffuse gallbladder wall thickening and distension as well as a small filling defect in the common bile duct (CBD) [Figure 1a]. After a blood culture sample was obtained, empirical intravenous (IV) ceftriaxone was administered on hospital day (HD) 1. On HD 2, therapeutic ERCP was performed. Written informed consent for ERCP was obtained from the patient. After endoscopic sphincterotomy (EST), a CBD stone was removed by retrieval balloon and basket, and a 7Fr endoscopic nasobiliary catheter was inserted into the CBD [Figure 1b]. The ERCP procedure was performed without difficulty, and no adverse event occurred during ERCP manipulation. Following ERCP, the patient developed a fever with a return of RUQ pain, and his antibiotics were changed to IV piperacillin/tazobactam; then, a second blood culture sample was obtained on HD 2. There was no growth on the first blood culture performed on HD 1. On HD 5, his condition worsened, with the development of severe chills, high fever, and RUQ pain. Repeat bloodwork revealed an elevated WBC count of 15460 mm³ with 82.4% neutrophils and a creatinine of 2.4 mg/dL. On the second blood culture performed after ERCP on HD 2, colonies of yeast were noted, and IV fluconazole (400 mg) was administered. To evaluate GB function, cholescintigraphy was performed, and an absence of GB filling was noted; therefore, laparoscopic cholecystectomy was performed on HD 7. After cholecystectomy, the patient clinically deteriorated into candidal septicemia, and subsequently,

into acute respiratory distress syndrome (ARDS) and acute kidney injury (AKI). Therefore, the patient was intubated and placed on a mechanical ventilator and administered continuous renal replacement therapy until HD 14 (postoperative day, POD 7). On HD 18 (POD 11), the patient complained of decreased visual acuity. On ophthalmologic examination, chorioretinal infiltrative spots of inflammatory cells due to hematogenous spread of *Candida* were noted [Figure 2a]. The second blood culture performed after ERCP on HD 2 revealed growth of *C. albicans* sensitive to fluconazole; therefore, a 28-day course of IV fluconazole was prescribed. Bile culture was negative for bacterial and fungal growth. After 2 weeks of IV fluconazole and intravitreal voriconazole therapy, the chorioretinal infiltrative spots were improved on ophthalmologic examination, and the visual acuity also improved [Figure 2b]. Resolution of the candidemia was confirmed by no growth of *C. albicans* on follow-up blood culture. On HD 44 (POD 37), the patient was discharged without additional sequelae.

DISCUSSION

Post-ERCP candidemia is a rare procedure-related complication.^[4] There is little information regarding development of candidemia following ERCP, especially in immunocompetent and noncritically ill patients. To date, three cases of post-ERCP candidemia have been reported [Table 1].^[1-3] One case was candidemia caused by *C. tropicalis* in an immunocompetent patient without risk factors, and the others were candidemia caused by *C. glabrata* and *C. tropicalis* in patients with risk factors for disseminated candidemia. Typically, disseminated candidemia develops in immunocompromised or critically ill patients.^[5] However, the patient in our case did not have any well-recognized risk factors or predisposing conditions for the development of disseminated candidemia including diabetes, human immunodeficiency virus infection with low cluster of

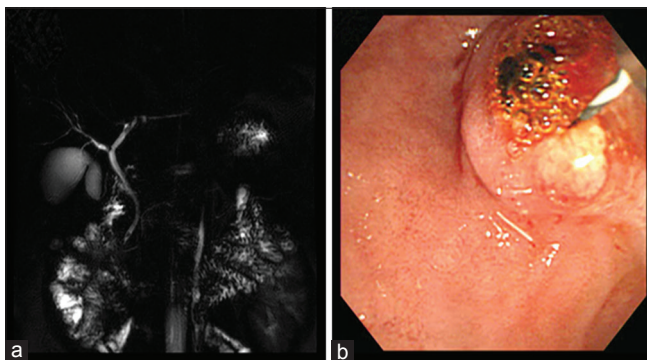


Figure 1: (a) A filling defect was noted in the distal common bile duct on magnetic resonance cholangiopancreatography (b) endoscopic retrograde cholangiopancreatography was performed. The common bile duct stone was removed by retrieval balloon and basket, and an endoscopic nasobiliary drainage was inserted



Figure 2: Ophthalmologic examination. (a) Infiltrative spots of inflammatory cells from the chorioretina into the vitreous due to hematogenous *Candida albicans* (arrows) were noted. (b) After 2 weeks of anti-fungal therapy, infiltrative spots in the chorioretina and vitreous were improved

Table 1: Detailed features of previously reported post-ERCP candidemia patients

Case	Reported year	Sex/age	Underlying disease	Indication for ERCP	Details of procedure	Species of Candida	Complications	Treatment	Course
1	1991 ¹	M/59	None	CBD stone	EST + ERBD	<i>Candida tropicalis</i>	Hepatic failure, AKI	N/A	Death on 16 th HD
2	1992 ²	F/73	Diabetes	CBD cancer	ERBD	* <i>Candida glabrata</i>	CHF	IV amphotericin B	Death
3	1995 ³	M/83	Rheumatoid arthritis	CBD stone	EST + ENBD	<i>Candida tropicalis</i>	Thrombophlebitis of right forearm	IV amphotericin B	Discharge on 29 th HD
Current case	2016	M/21	None	CBD stone	EST + ENBD	<i>Candida albicans</i>	ARDS, AKI Endophthalmitis	IV fluconazole + intravitreal injection of voriconazole	Discharge on 44 th HD

ERCP: endoscopic retrograde cholangiopancreatography; M: male; F: female; CBD: common bile duct; EST: endoscopic sphincterotomy; ERBD: endoscopic retrograde biliary drainage; ENBD: endoscopic nasobiliary drainage; AKI: acute kidney injury; CHF: congestive heart failure; ARDS: acute respiratory distress syndrome; N/A: not available; IV: intravenous; HD: hospital day. * *Candida glabrata* was previously known as *Torulopsis glabrata*

differentiation (CD) 4+ T cell counts, the prolonged use of antibiotics, neutropenia, indwelling intravenous or urinary catheters, total parenteral nutrition administration, parenteral glucocorticoid administration, severe burns, abdominal or thoracic surgery, cytotoxic chemotherapy administration, the use of immunosuppressive agents for organ transplantation, mechanical ventilator usage, or low birth weight neonates.^[6]

There were several potential sources of *Candida* spread to the bloodstream in the present case. First, localized candidal infection of the GB or CBD may have been disseminated hematogenously following ERCP manipulation. Second, candidal contamination of the ERCP equipment and nasobiliary catheter or endoscope could have spread to the bloodstream through the EST site. Third, systemic infection caused by *C. albicans* caused by ascending retrograde spread of a localized biliary infection secondary to colonization of the gastrointestinal tract (including the oropharynx and mouth) after ERCP could have developed. Fourth, hematogenous spread of *Candida* from the skin through the IV line could have occurred incidentally around the time of ERCP.

In conclusion, we report the first case of disseminated *C. albicans* infection following ERCP manipulation with secondary complications of ARDS, AKI, and endophthalmitis in an immunocompetent host. The present case highlights the awareness to consider candidemia as a rare but possibly life-threatening adverse event of ERCP, even in immunocompetent patients without apparent risk factors.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed. Consent of the case report was obtained from the Institutional Review Board at Chuncheon Sacred Heart Hospital.

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Conflicts of interest

There are no conflicts of interest.

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