

CASE REPORT

Candida endophthalmitis and *Candida* pneumonia after trans-urethral lithotripsy: A case report

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Key Clinical Message

Invasive candidiasis may be one of the serious complications of transurethral lithotripsy. Candiduria before this procedure should be assessed, and antifungals should be prescribed.

Abstract

This case is about a 44-year-old diabetic female patient who, after trans-urethral lithotripsy with double-J stent insertion, was diagnosed with *Candida* pneumonia and *Candida* endophthalmitis.

KEYWORDS

Candida, endophthalmitis, fungal infections, fungi, lithotripsy, pneumonia

1 | INTRODUCTION

Candida spp. is a member of the normal human microbiome without harming the host. As an opportunistic fungus, under certain circumstances, whenever the host's immune status or its microbiota becomes disturbed, it can cause severe infections. *Candida* spp. is the fourth most common cause of hospital-acquired systemic infections in the United States, with a high mortality rate (up to 50%).¹

There are several risk factors for infections caused by *Candida* spp., such as the broad spectrum of antibiotics,

neutropenia, diabetes mellitus (DM), acquired immunodeficiency syndrome, acute renal failure, wounds, surgery, indwelling intravascular catheters, and long-term corticosteroid treatment.²⁻⁴

In recent years, invasive fungal infections have increased steadily. *Candida* endophthalmitis (CE) and *Candida* pneumonia (CP) are uncommon entities. Thus, it might be frequently overlooked in differential diagnosis.^{5,6} Here, we report a rare case of CE and CP as a complication of trans-urethral lithotripsy (TUL) in a diabetic patient.

2 | CASE HISTORY/ EXAMINATION

A 44-year-old diabetic female patient with a 5-year history of DM and renal stones presented to the emergency department with acute left flank pain, fever, chills, nausea, vomiting, and dysuria. She received metformin for several years. The patient was admitted to the urology service with stable vital signs, and a diagnosis of acute pyelonephritis was made. Ultrasound evaluation revealed left renal calculi with stones of 135 and 22 mm with grade 1 hydronephrosis. Renal computed tomography (CT) without contrast also detected stones with moderate–severe hydronephrosis. The laboratory data were as follows: white blood cells (WBC): 14,500/mm³, (PMN: 90%), hemoglobin (Hb): 10.5 g/dL, platelets (PLT): 159,000/mm³, blood urea nitrogen (BUN): 20 mg/dL, creatine (Cr): 1.2 mg/dL, erythrocyte sedimentation rate (ESR): 56 mm/h and C-reactive protein (CRP): 67 mg/dL. The urine analysis showed pyuria (WBC: many, RBC: 2–3), and the urine culture revealed both *Candida albicans* and *Escherichia coli*. She was prescribed an empiric antibiotic for *E. coli* and underwent TUL with the insertion of a double-J stent in the left pelvis. The patient was discharged after 4 days on oral antibiotics.

One week after discharge from that medical center, the patient's double-J stent was removed spontaneously, and she was admitted to our hospital for the first time with fever, chills, and slight right eye redness. The patient was hemodynamically stable, with a pulse rate of 90 beats per minute, a respiratory rate of 18 breath per minute, a blood pressure of 120/80 mmHg, and a temperature of 39°C.

3 | METHODS

Ultrasound imaging reported at least seven stones of 1–2 cm in the left kidney and pyonephrosis. In addition, CT scans without contrast revealed numerous stones in the left kidney with hydronephrosis. She was started on empiric intravenous antibiotics. The laboratory tests revealed WBC: 12,800/mm³ (PMN of 70%), ESR: 110 mm/h, Hb: 10 g/dL, HbA1C: 12.2%, PLT: 513,000/mm³ BUN: 28 mg/dL, Cr: 1.74 mg/dL, and CRP: 92 mg/dL. She had negative blood cultures, while her urine analysis indicated pyuria and the urine culture indicated *Candida albicans*.

Acutely, the patient developed severe vision loss in the right eye, and a dry cough was added to the symptoms. Due to severe vision loss in the right eye, the ophthalmology service was consulted for the patient (Figure 1A,B). The diagnosis of CE was made, the patient underwent a right eye vitrectomy, and an intravitreal injection of amphotericin-B was performed. Vitreous sample was sent

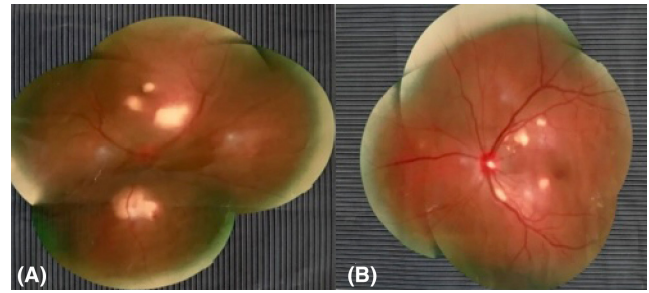


FIGURE 1 Color fundus photography of the (A) right and (B) left eyes showing diffuse yellowish-white patches in retina involved macula.

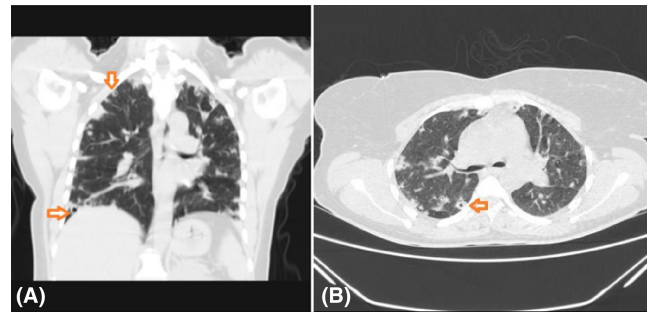


FIGURE 2 (A) Coronal and (B) axial CT images showing multiple subpleural vessels related cavitory nodules which are suggestive of blood dissemination of infection.

for smear and culture, which revealed *Candida albicans*. Intravenous liposomal amphotericin-B (350 mg/day) was started. Ureteral stent was also inserted.

Concomitantly a lung CT scan was performed for dry cough and shortness of breath (Figure 2), which revealed vessels related cavitory nodules compatible with hematogenous infectious process. The patient underwent bronchoscopy and bronchoalveolar lavage (BAL). BAL culture was positive for *Candida albicans*.

4 | CONCLUSION AND RESULTS

The diagnosis of CE and probable CP was made and antibiotics were discontinued. In addition, she was treated with intravitreal injections of amphotericin-B into the vitreous on two other occasions.

Three weeks after initiating liposomal amphotericin-B treatment, the patient was able to detect light, and the leukocytosis was resolved. The patient was discharged with significant vision improvement and relief of pulmonary symptoms. Treatment continued with step-down therapy with oral fluconazole at a loading dose of 800 mg, then 400 mg daily for 2 months. There was no recurrence in the 6-month follow-up. The signs and symptoms were completely resolved.

5 | DISCUSSION

Fungal endophthalmitis is a severe eye infection caused by fungus infections from endogenous or exogenous sources. The most common causes of fungal endophthalmitis are *Candida* spp., *Aspergillus* spp., and *Coccidioides* spp. The most common risk factors for endogenous *Candida* endophthalmitis include recent hospitalization, DM, gastrointestinal intervention, long-term antibiotic use, indwelling catheters, candiduria, hyperalimination, hemodialysis, chronic liver disease, neutropenia, immunomodulatory therapy, organ transplantation, alcoholism, intravenous drug abuse, and human immunodeficiency virus.^{6,7} Symptoms of endogenous fungal endophthalmitis include visual loss, red eye, photophobia, and pain. However, some patients remain asymptomatic during the initial stage or have a lesion in the peripheral retina.⁸

In a patient who is a candidate for TUL and a double J stent, urine should be examined, and in cases of asymptomatic candiduria before TUL, prophylactic antifungals should be prescribed to prevent disseminated candidiasis.⁴ In this case, the urine culture was positive for *Candida albicans* and *Escherichia coli* at first admission, but the patient did not receive an antifungal drug. After the patient underwent TUL with a double-J stent, invasive candidiasis occurred, and CE and CP diagnoses were established. Studies have shown that the sensitivity of blood culture for the detection of candidemia is approximately 50%⁹ and it can justify the negative blood cultures in our patient.

CE has been reported after lithotripsy^{6-8,10} (Table 1). The most common symptom among these cases was blurring and gradual vision loss, 1 or 2 weeks after lithotripsy

occurred. After 1 week, our patient had two of these symptoms, including slight redness in the right and left eyes, and then severe vision loss in the right eye.

CP has been reported in severely immunocompromised individuals with disseminated disease, extremely low birth weight infants, and patients with malignant tumors, indwelling catheters, and DM. We found two case reports of lung complications after TUL (Table 1).^{11,12} Cultures and PCR of BAL that are positive for *Candida* spp. cannot be the sole basis for definitive CP diagnosis. The proven diagnosis requires histologic evidence of fungal invasion of lung tissue.^{2,5} In our case lung biopsy was not performed.

Although lithotripsy is a minimally invasive intervention, it may lead to complications such as hemorrhage, perforation, mucosal laceration, infection, damage to nearby organs, and displacement of calculi or residue.¹¹ In the presented case, clinical manifestations occurred shortly after TUL, suggesting a possible relationship between the procedure and disseminated candidiasis.

For severe cases of CE, the adjunctive use of vitrectomy by intravitreal injection of amphotericin, fluconazole, and systemic antifungal therapy is recommended.^{2,6-8,13} In the presented case, vitrectomy, amphotericin-B, and then step-down therapy with fluconazole resulted in clinical improvement.

CE and CP may be one of the most serious therapeutic complications of TUL. Although this case is rare, physicians should be aware of the potentially visual and pulmonary-threatening complications that can occur after TUL. Rapid diagnosis and timely initiation of antifungal therapy improve outcomes.

TABLE 1 A summary of six published cases of complication after renal stone lithotripsy.

Author	Age (gender)	Type of lithotripsy	Presentation	Time presentation
Shirvani (2019) ⁷	32 (F)	ESWL	Blurred vision and floater in right eye	1 week after ESWL
Shirvani (2019) ⁶	31 (F)	TUL with double-J stent placement	Gradual reduction in visual acuity in left eye	2 weeks after TUL
Yuan (2017) ⁸	54 (M)	ESWL	Blurring and gradual vision loss	1 week After ESWL
Lavine (2015) ¹⁰	48 (M)	ESWL and ureteral stent placement	Blurred central vision in right eye	1 month After ESWL
Zhang (2015) ¹¹	50 (F)	Pneumatic Lithotripsy	Chest distress and palpitations during lithotripsies	During lithotripsies
Nouri-Majalan (2010) ¹²	31 (M)	ESWL	Left pleuritic chest pain	1 week After ESWL
Presenting case	44 (F)	TUL with double-J stent placement	Fever, dry cough and severe blindness of the right eye	1 week after ESWL

AUTHOR CONTRIBUTIONS

Atousa Hakamifard: Conceptualization; writing – original draft; writing – review and editing. **Farzin Khorvash:** Conceptualization; data curation; writing – review and editing. **Somayeh Hajiahmadi:** Investigation; writing – review and editing. **Yasaman Eskandari:** Conceptualization; data curation; writing – review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

ETHICS STATEMENT

This study was approved by the ethics committee of Isfahan University of Medical Sciences (Ethical code: IR.MUI.MED.REC.1399.395).

CONSENT

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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