

## Case Report

## URINARY TRACT INFECTION BY CANDIDA AURIS IN A PATIENT ADMITTED IN A PICU OF TERTIARY CARE HOSPITAL, WESTERN RAJASTHAN

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Received : 10/05/2025  
 Received in revised form : 05/07/2025  
 Accepted : 28/07/2025

**Keywords:**  
*Candida auris*, UTI, Nosocomial infection, MALDI-TOF MS, PICU.

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DOI: 10.47009/jamp.2025.7.4.254

Source of Support: Nil,  
 Conflict of Interest: None declared

*Int J Acad Med Pharm*  
 2025; 7 (4); 1335-1337



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**ABSTRACT**

**Background:** *Candida auris* first emerged as an opportunistic budding yeast in 2009 in Japan. In the last decade it has been rapidly emerging as multidrug resistant pathogenic yeast worldwide mainly in intensive care units. Rapid dissemination in healthcare settings, resistance to antifungals and difficult to identify by conventional methods with high mortality rate of 30-60 % (1) has made *Candida auris* infection a serious threat globally. We present first case report of *Candida auris* urinary tract infection in PICU of tertiary care center of Western Rajasthan to signify the importance of timely and correct identification by MALDI-TOF MS and how correct identification and timely intervention can prevent the spread of this infection from becoming an outbreak. **Case report:** The patient was a 7-year-old female with history of RTA who underwent intubation and urinary catheterization and admitted in PICU for comminuted fracture of right temporal bone with subgaleal hematoma. She developed fever 3 days after with raised TLC count. Fever persisted on day 5 despite of patient being on prophylactic antibiotics. Urine culture yielded *Candida auris* which was identified by the matrix-assisted laser desorption/ionization-time of flight mass spectrometry. The patient was successfully treated with immediate removal and change of urinary catheter and intravenous voriconazole. **Conclusion:** *Candida auris* being multidrug resistant with high potential of nosocomial spreading and causing outbreaks it becomes a high priority pathogen. It is very difficult to identify *Candida auris* with conventional methods and even more difficult to treat, so clinicians and microbiologists must work in collaboration to timely diagnose and treat along with taking necessary infection control measures to prevent outbreaks. As it is difficult to diagnose by conventional methods, our case report also highlights the importance of use of MALDI-TOF MS in its timely identification and thus proves to be an ideal tool for clinical research and microbiology especially in a tertiary care centre.

**INTRODUCTION**

In the recent years, UTIs caused by Gram negative bacilli is showing decreasing trend with increasing frequencies of UTIs caused by fungi.<sup>[1-4]</sup> Among fungi the most common fungi causing UTI is *Candida albicans*, other species such as *Candida glabrata*, *Candida tropicalis*, *Candida parapsilosis*, *Candida lusitanae*, and *Candida guilliermondii* have also been identified as infecting pathogens.<sup>[5-7]</sup> In past few years, *Candida auris* has emerged as the etiologic agent in UTIs throughout the world.<sup>[1,6,7]</sup> In 2022 WHO released its first ever Fungal Priority Pathogen List (FPPL) listing *Candida auris* in the highest risk category -critical owing to its virulence, multidrug resistance, ability to form biofilm and high mortality rate.<sup>[1,8-10]</sup> Immunocompromised individuals in

healthcare settings are more vulnerable to this infection. Due to its ability to survive on surfaces for extended periods it is more likely to cause outbreaks in healthcare setups especially ICUs and making infection control really challenging. To date, maximum cases of *Candida auris* have been reported from blood cultures particularly in high-risk populations such as those with comorbidities, indwelling catheters or recent hospitalization but UTIs by *Candida auris* are increasing reported in the recent years due to advent of automated system such as MALDI-TOF MS.

**CLINICAL PRESENTATION**

A 7year old female with history of RTA was admitted to our hospital in an unconscious state with right ear

bleed and GCS score of E1V1M5. Patient was immediately intubated and urinary catheterization done and shifted to PICU. HRCT head and NCCT head were done and patient was diagnosed with comminuted fracture of squamous part of right temporal bone with pneumocephalus with subgaleal hematoma. On day 3 of admission patient developed fever (39°C). Complete blood count showed raised TLC count with reactive CRP. Liver Function Tests (LFT) and Kidney Function Tests (KFT) were within normal limits. Prophylactic antibiotics were started patient regained consciousness but fever persisted till day 5. On day 5 urine for fungal hyphae were sent which reported presence of budding yeast cells with pseudohyphae. Following which prophylactic antifungal fluconazole was started but fever persisted till day 7. On day 7 urine sample for culture and sensitivity was sent. Urine analysis showed pyuria (grade 3+). Urine culture showed growth on Hichrome agar as whitish dry pinpoint colonies, Colony forming units  $> 10^5$  colonies. Gram staining revealed Gram's positive budding yeast cells. Germ tube test was negative indicating initial diagnosis towards *Non albicans candida*. Growth on CHROM agar and saborouand's dextrose agar showed whitish pasty colonies. Gram staining from these colonies also showed Gram positive budding yeast cell. Species identification was done by MALDI-TOF as *Candida auris* and antifungal susceptibility testing was done by conventional method (Kirby Bauer disk diffusion method) and the resulting zones was measured and then interpreted according to the CLSI guidelines M44-A.<sup>[11]</sup> showed resistance to fluconazole, itraconazole and amphotericin B and susceptible to voriconazole. Blood cultures from the patient was negative. Physician was immediately informed and the patient was kept in isolated room with immediate changing of urinary catheter and started on susceptible antifungal voriconazole with immediate implementation of infection control practices including contact precautions and environmental cleaning. Two days later patient's fever subsided. After 7 days of therapy repeat urine cultures showed no growth. Repeat NCCT head showed no enlargement of hematoma. Patient recovered successfully and discharged. Swabs from patient's surroundings such as bed, bedsheets and table were processed and found negative for *Candida auris* and also swabs from nearby patient's taken and processed which were also found to be negative for *Candida auris*. No secondary cases were identified.



## DISCUSSION

*Candida auris* UTIs are often associated with hospital admission, indwelling devices and underlying comorbidities. Report of *Candida auris* bloodstream infections are frequently reported but *candida auris* UTI are less frequently reported,<sup>[1,6,7]</sup> and this is first case of UTI by *candida auris* reported from our center.

Hong et al,<sup>[12]</sup> reported a similar case report in an 81-year-old female with cerebral hemorrhage admitted to the hospital and diagnosed with a urinary catheter-related *C. auris*. The antifungal drug susceptibility test showed 5-fluorocytosine (FC) was sensitive, and Amphotericin B (AB) minimum inhibitory concentration (MIC)  $\geq 2$  as drug resistance, ITR (itraconazole) was sensitive, and Voriconazole (VOR) was resistance. The important risk factor reported was older age group with existing comorbidity such as diabetes, hypertension and prolonged hospital with indwelling catheter whereas in our study prominent risk factor was younger age, indwelling catheter and catheterization done in trauma centre of a tertiary care center as adherence to strict aseptic precautions often gets neglected due to overburdened staff.

Diagnosis requires high clinical suspicion as conventional methods may misidentify *C. auris* as other *candida* species leading to prolonged morbidity and in some cases leading to outbreaks and mortality. But due to availability of MALDI-TOF MS now the chances of misidentification/ misdiagnosis have been decreased.<sup>[5]</sup>

Treatment typically involves removal of foreign devices and antifungal therapy guided by susceptibility testing as *C. auris* are typically multidrug resistant making it difficult to treat.<sup>[5,13]</sup>

Most of the isolates are resistant to fluconazole and amphotericin B whereas resistance to Echinocandins and flucytosine are less commonly seen.<sup>[8,14,15]</sup> In our study the isolate was found to be resistant to fluconazole, itraconazole and Amphotericin B and found to be susceptible to voriconazole and the patient was successfully treated with voriconazole.

This case highlights the importance of early recognition and appropriate antifungal stewardship to prevent complications and transmission.

## CONCLUSION

*Candida auris* UTI is an emerging clinical challenge, particularly among vulnerable hospitalized patients. Prompt identification, appropriate antifungal therapy and strict infection control practices are critical to improve outcome and limit spread.

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