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Case Report

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Emerging Fungus, *Candida auris*: A Case Report

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ABSTRACT

Candida auris is a growing fungal threat that has sparked global concern. It has been linked to healthcare-related outbreaks and infections around the world and has been reported in numerous countries. This case report describes an infection caused by *Candida auris* in a 21-year-old patient with a prolonged hospital stay. On the 60th day of admission, the patient developed persistent fever and cerebrospinal fluid culture revealed *Candida spp.* Identification of the species and antimicrobial susceptibility testing was done by VITEK-2. The isolate was sensitive to flucytosine and voriconazole and resistant to fluconazole and amphotericin B. Voriconazole was started after the culture and sensitivity results.

Keywords
Candida auris; emerging fungus; multidrug resistant

INTRODUCTION

Candida auris, first identified in 2009, in Japan, is a yeast-like fungus that has become a major concern for healthcare settings. It is an emerging fungus that has been linked to healthcare-related outbreaks and infections around the world, with 37 countries now reporting cases.[1–3]The World Health Organization (WHO) has classified *Candida auris* as a critical priority pathogen because its significance as a global public health threat.[3] It has the capability to survive for extended periods on patients' skin and mucosal surfaces, as well as in hospital environments. Additionally, it is highly transmissible, can cause serious systemic infections in vulnerable patients, especially immunocompromised patients. It shows growing resistance to common antifungal drugs which poses significant challenges in treating such infections.[4,5] In a relatively short period, *C. auris* has spread all over the world, mainly in hospitals among admitted patients. It is the first fungus to behave similarly to an epidemic outbreak of a nosocomial bacterial pathogen.[6] This report describes the first documented case of cerebrospinal fluid (CSF) infection caused by *Candida auris* from a tertiary care hospital in Kathmandu, Nepal indicating the emergence of

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Figure 1. Candida auris growth on Sabouraud dextrose agar

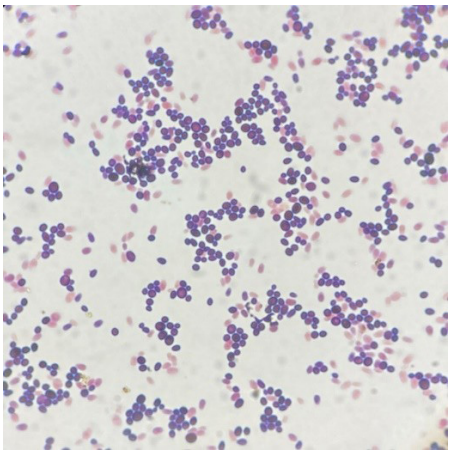

Figure 2. Candida auris on Gram staining

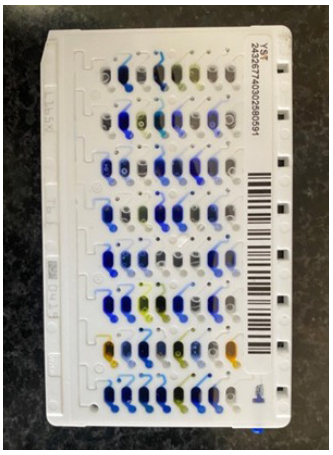

Figure 3. VITEK-2 cartridge used for identification of Candida auris

this multidrug-resistant fungal pathogen in Nepal's healthcare settings. This finding is significant not only nationally but also globally, as it adds to the growing body of evidence that *C. auris* continues to spread and cause invasive infections in diverse geographic regions, posing substantial challenges for infection control and patient management.

CASE PRESENTATION

A 21-year-old male from Hetauda, Makwanpur district of Bagmati Province, Nepal was admitted as a triage II case in the yellow zone of the emergency department at Tribhuvan University Teaching Hospital (TUTH), Kathmandu, Nepal after being referred from Chitwan Medical College in Bharatpur, Nepal with a provisional diagnosis of an intracranial space occupying lesion (ICSOL).

On admission, the patient was ill-looking, and airway, breathing and circulation were intact. The Glasgow coma scale (GCS) of the patient was E4V4M5 (13/15). The pulse rate was 79 beats/minute, blood pressure was 140/70 mm of Hg, respiratory rate was 18 breaths/minute and SpO_2 was 91% on room air. Respiratory, cardiovascular and gastrointestinal system examination revealed no abnormality. On central and peripheral nervous system examination, cranial nerve VI palsy was detected with deviation of the uvula. Cerebellar function and sensory function were intact.

The patient was diagnosed as a case of right thalamic glioma with communicating hydrocephalus. Therefore, a ventriculoperitoneal (VP) shunt was placed on the 7th day of admission (DOA). A navigation guided biopsy was taken on the 14thday. Biopsy revealed glioblastoma, isocitrate dehydrogenase (IDH)-wild type, grade 4. Subsequently, an external ventricular drain (EVD) was placed on the 36th day of admission.

On the 60th DOA, the patient developed fever despite being on prophylactic antibiotics (azithromycin and meropenem). Laboratory investigations were ordered along with CSF for biochemical and cytological analysis and culture and sensitivity test.

CSF was collected in a sterile container from the VP shunt for culture, following strict aseptic procedures. The skin over the shunt reservoir was disinfected thoroughly by 70% alcohol and then 2% chlorhexidine. A sterile 25G needle was inserted perpendicular to the reservoir to collect CSF. The specimen[7] was immediately transported to the microbiology laboratory. CSF analysis revealed total leukocyte count (TLC) 35/mm^3, polymorph 05%, monomorphs 95%, sugar 3.8 mmol/L, microprotein 399 mg/dl and red blood cell 10/mm^3. Following centrifugation of CSF, wet mount smear examination did not show any significant finding. However, an India ink stain of the CSF showed a few non-capsulated yeast cells.

Subsequently, CSF was inoculated on Chocolate agar, Blood agar, MacConkey agar and Sabouraud dextrose agar media and incubated at 37ºC for 24 hours. White, smooth, butyrous colonies with entire margins were detected on all the media. Gram stain showed small Gram-positive budding yeasts like cells arranged in small clumps. A germ tube test performed from the colonies was negative. CSF culture after treating with 10% NaCl and overnight incubation at 42ºC also showed similar growth on all the media. Subsequently, a provisional diagnosis of *Candida spp* other than *Candida albicans* was made.

For further identification and antifungal drug susceptibility testing, the organism was subjected to an automated diagnostic instrument, VITEK-2. The isolate was identified as *C. auris* by VITEK-2 and was sensitive to flucytosine (minimum inhibitory concentration (MIC)<=1µg/ml), and voriconazole

(MIC 0.25µg/ml) while resistant to amphotericin B (MIC 8µg/ml) and fluconazole (MIC 32 µg/ml). A repeat sample received on the 63rd DOA in the Microbiology laboratory, again isolated and identified *C. auris* with similar antifungal susceptibility results. Antifungal therapy with voriconazole was started immediately after the culture and sensitivity results.

DISCUSSION

To the best of our knowledge, this is the first documented case of *Candida auris* infection from Nepal to date. *C. auris* has been isolated in many countries across the world, and whole-genome sequencing (WGS) has revealed five distinct clades.[8,9] A novel sixth clade has been identified in Bangladesh, by WGS in 2024.[10]

This is the first and only case of *C. auris* among many other yeasts isolated from CSF at TUTH, Kathmandu, Nepal. We routinely identify and determine the antimicrobial susceptibility pattern of clinically significant fungi by VITEK-2. CSF infection by *C. auris* in this patient was healthcare-associated, facilitated by risk factors such as a ventriculoperitoneal shunt with an external ventricular drain, central venous catheter, broad-spectrum antibiotics and a prolonged hospital stay. This organism exhibited a higher MIC for amphotericin-B (MIC 8µg/ml) and fluconazole (MIC 32 µg/ml) while being sensitive to flucytosine (MIC<=1µg/ml) and voriconazole (MIC 0.25µg/ml). Voriconazole 400mg PO stat then 200mg PO BD was added to the drug prescription immediately. Unfortunately, the patient expired in the ICU on the 67th day of admission with grade-4 glioblastoma as the primary cause.

CONCLUSION

This case highlights the clinical challenges presented by an emerging multidrug resistant *C. auris*. Early identification and proper treatment by antifungal agents guided by antifungal susceptibility testing is crucial for the stringent management of *C. auris* infection and the limitation of nosocomial transmission. Clinical awareness coordinated with infection prevention strategies and a robust diagnostic facility in the Microbiology laboratory is essential to mitigate the impact of *C. auris* in healthcare settings.

CONSENT

Written informed consent was obtained from the closest available relative at the time for the publication of this article.

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CONFLICT OF INTEREST

The author(s) declare that they do not have any conflicts of interest with respect to the research, authorship, and/or publication of this article.

AUTHOR CONTRIBUTIONS

RKJ, MA and SR performed the laboratory work and followed up the patient. SR, JRR, CS, HPK and SS confirmed the case. RKJ and SR prepared the manuscript. All authors reviewed the manuscript.

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