



## Original Article

# Candida Auris Endocarditis: An Enigmatic Case from Diagnosis to Management

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### Abstract

**Background:** The most common diagnosed cause of invasive candidiasis is *Candida Albicans* but according to literature a lot of confirmed cases of *Candida Auris* become emerging multidrug-resistant infections. In a Japanese patient in 2009, *Candida Auris* was first described. This fungus is attributed to many outbreaks in different countries. It is a highly resistant variant and one of the most violent emerging pathogens.

**Case presentation:** We present a case of endocarditis caused by *Candida auris* that resulted in a large vegetation on the mitral valve with severe mitral regurgitation.

**Conclusion:** Management of endocarditis by collaboration between surgical and non-surgical facilities may ensure a good outcome even in the case of rare violent infections.

### KEYWORDS

*Candida Auris*;  
Infective endocarditis;  
Severe mitral regurgitation;  
Central venous catheters;  
Candidemia

### Article History

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### Introduction

Infective endocarditis is a serious condition that can lead to death. Despite recent advances in treatment, it still has a high death rate and devastating comorbidities. Due to an increase in people at risk and improved diagnostic techniques, incidence has increased over the past few decades [1]. About 2% of all cases of infective endocarditis are caused by fungus. [2]. More than 70% of instances of fungal endocarditis are caused by *Candida* species, and the remaining cases (about 20% to 30%) are predominantly brought on by *Aspergillus* species infection. which is the most prevalent source of intracardiac fungal ball [3]. *Aspergillus* endocarditis (AE) is difficult to diagnose and treat, and it has a poor prognosis and a high fatality rate. It is primarily associated with host-predisposing diseases, such as immunosuppression, or risk factors, such as prosthetic valves, indwelling central venous catheters, persistent fungemia, or intravenous (IV) drug usage, and it can damage native and

prosthetic valves or be cardiac device-related [2-4]. *Candidaemia* is most commonly associated with invasive *Candida* infections, which occurs in immunocompromised patients and those requiring intensive care. *Candida Auris* is an emerging fungus that seriously threatens global health. It's frequently multidrug-resistant, which means it's resistant to various antifungal medications used to treat *Candida* infections. Some strains are resistant to antifungals from all three classes. Standard laboratory methods are challenging to detect and can be misinterpreted in labs lacking specialised technology. Misidentification may lead to inappropriate management. In Saudi Arabia, *C. auris* is a rare infection and only six cases of *C. auris* have previously been reported; here, we report a new case of this infection.

### Case description

A 48 years old male with a known history of ESRD on regular dialysis 3 times a week was



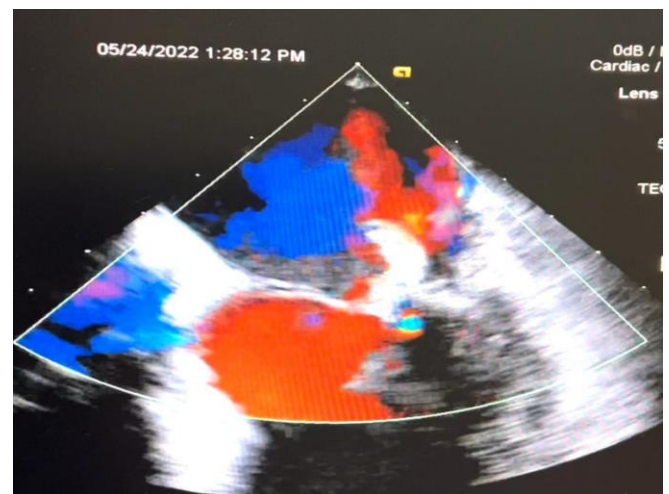
admitted to the hospital on the 10th of April 2022 with sharp back pain reliving with analgesic and aggravated by movement diagnosed with spondylodiskitis based on CT finding that showed soft tissue density destructive lesion at the level of T6-T7 intervertebral disk, no intervention was made except for Tramadol and paracetamol for pain relief. The patient had multiple morbidities including heart failure with an ejection fraction of 35-40% by echocardiography on bisoprolol, morbid obesity, smoking, history of pulmonary embolism and left lower limb deep vein thrombosis 6 months ago on warfarin, bilateral innominate vein occlusion, also a history of allergy on an antihistamine for 8 years and did parathyroidectomy 2 years ago. Glasgow coma scale (GCS) was 14/15. During admission patient had recurrent hypotensive episodes (Mean arterial blood pressure = 50) during dialysis and the venous blood gas has the following parameter: PH= 7.23, HCO<sub>3</sub>=18, K= 7.2 and Ca gluconate was given to lower the hyperkalemia. On day 10 upon admission patient had septic shock with hypoperfusion states and left femoral catheter was inserted. Culture reveled Meticillin-Sensitive Staphylococcus aureus (MSSA) as the causative organism and vancomycin and meropenem were given and ECHO shows normal valves with no sign of infective endocarditis.



*Figure 1: A transesophageal echocardiogram (TEE) demonstrated large pedunculated Finger like shape vegetations on the Posterior leaflet of Mitral valve.*

Five days later patient complained of bilious vomiting and constipation, CT shows dilated small bowel and suspicious bowel necrosis. Emergency laparotomy revealed no bowel perforation and right hemicolectomy was done with end ileostomy. Vacuum assisted closure (VAC) was applied. Multiple sessions of debridement and

VAC change were done. Respiratory culture reveled: stenotrophomonas maltophilia and yeast. Ascites fluid reveled by polymerase chain reaction (PCR): pseudomonas, Bacteroides fragilis, candida albicans. Meropenem, colistin, Vancomycin, anidulafungin and hydrocortisone were given with close monitoring. On 24th May echocardiography was performed and showed a large, pedunculated Finger like shape mobile vegetation on the posterior mitral leaflet and another small pedunculated mobile vegetation on the anterior mitral leaflet. Surprising there was loss of continuity of the anterior mitral leaflet (windsock) at the base of the vegetation in the anterior mitral leaflet with detectable flow with color flow echo indicating perforated anterior mitral leaflet (Figure 1). Moderate mitral valve regurgitation is seen (Figure 2). After one day the patient underwent mitral valve repair and the vegetation were removed (Figure 3). Blood culture shown candida auris infection. On 1st June 2022, the patient hemodynamic and neurologic condition deteriorated and died eventually.



*Figure 2: Moderate mitral valve regurgitation*

## Discussion

Since *C. auris* was first discovered in Japan in 2009, many cases have been reported in United States, Kuwait, South Africa, Kenya and more recently in Colombia, Venezuela, India, Pakistan, the United Kingdom, and South Korea. [5]. For effective antifungal therapy and to reduce outbreaks of this species, accurate and early identification of *C. auris*, as well as timely notification of its presence in a hospitalized patient, are essential. [6]. Many papers describing *C. auris* point out that this species is commonly misdiagnosed, which is similar to our situation [7].

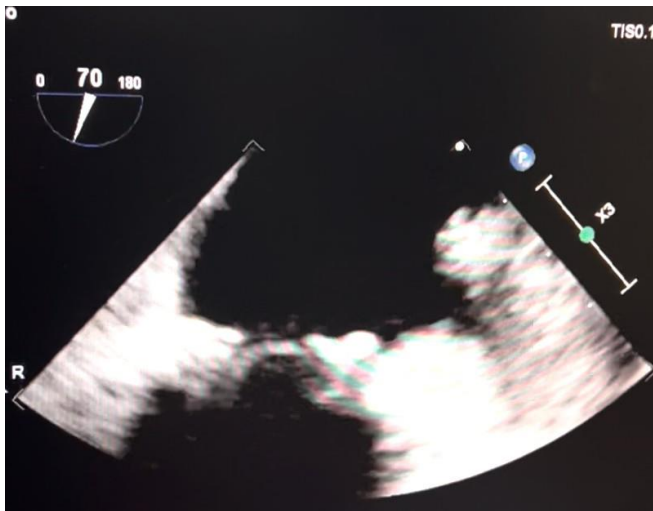


Figure 3: The echocardiography showing the disappearance of vegetation after Surgery

Our patient had mitral valve endocarditis, underwent substantial heart and colon surgery, was immunocompromised, required a central venous catheter for several weeks, and required a lengthy course of broad-spectrum antibiotics and immunosuppressants. All of these conditions have long been considered risk factors for chronic candidiasis, candidemia, and, in some situations, *C. auris* infections [8]. Successful treatment of endocarditis requires the combination of antifungal therapy and surgical debridement [9]. The recommended antifungal therapy is Amphotericin B with or without flucytosine or echinocandins is advised as the first line of treatment for *Candida* native valve endocarditis as well as prolonged or lifelong fluconazole suppressive treatment. In addition, valve replacement is strongly recommended according to the literature [2,3-6]. In our case *C. auris* is a fatal infection and has a poor prognosis and a high fatality rate, this result is similar to a study done in USA and Spain [10-11].

### Conclusion

*C. auris* is an emerging as well as opportunistic multidrug-resistant human infection. In order to identify it accurately and quickly and to stop it from spreading, stronger steps must be taken. To achieve this, it will be necessary to enhance infection prevention and control procedures and to encourage antifungal stewardship in healthcare settings. In order to better manage this developing infection, more study is absolutely necessary to understand the mechanisms that contribute to virulence.

**Conflict of interest:** Authors declare no conflict of interest.

### References

1. Garzoni C, Nobre VA, Garbino J. [Candida parapsilosis endocarditis: a comparative review of the literature](#). European journal of clinical microbiology & infectious diseases. 2007; 26 (12): 915-26.
2. Tattevin P, Revest M, Lefort A, Michelet C, Lortholary O. [Fungal endocarditis: current challenges](#). International Journal of Antimicrobial Agents. 2014; 44(4): 290-4.
3. Kalokhe AS, Roupheal N, El Chami MF, Workowski KA, Ganesh G, Jacob JT. [Aspergillus endocarditis: a review of the literature](#). International Journal of Infectious Diseases. 2010; 14 (12): e1040-7.
4. Pierrotti LC, Baddour LM. [Fungal Endocarditis, 1995–2000](#). Chest. 2002; 122 (1): 302-10.
5. Vallabhaneni S, Kallen A, Tsay S, et al. [Investigation of the First Seven Reported Cases of Candida auris, a Globally Emerging Invasive, Multidrug-Resistant Fungus-United States, May 2013-August 2016](#). American journal of transplantation. 2017; 17 (1): 296-9.
6. Lone SA, Ahmad A. [Candida auris—the growing menace to global health](#). Mycoses. 2019; 62 (8): 620-37.
7. Jeffery-Smith A, Taori SK, Schelenz S. [Candida auris: a review of the literature](#). Clinical microbiology reviews. 2018; 31 (1):e00029-17.
8. Cortegiani A, Misseri G, Fasciana T, Giammanco A, Giarratano A, Chowdhary A. [Epidemiology, clinical characteristics, resistance, and treatment of infections by Candida auris](#). Journal of intensive care. 2018; 6 (1): 1-3.
9. Alebrahim K. [Successful surgical treatment of mitral valve endocarditis caused by Staphylococcus lugdunensis](#). JKAU: Med Sci. 2007, 14: 73-79.
10. Lockhart SR. [Current epidemiology of Candida infection](#). Clinical Microbiology Newsletter. 2014; 36 (17): 131-6.
11. Quindós G. [Epidemiology of candidaemia and invasive candidiasis. A changing face](#). Revista iberoamericana de micologia. 2014; 31 (1): 42-8.