

# CANDIDEMIA -INDUCED CATHETER RELATED BLOODSTREAM INFECTION: A CLINICAL CASE REPORT

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## ABSTRACT:

Catheter-related bloodstream infection (CRBSI) is a major health problem for patients with chronic kidney disease who are on long-term hemodialysis. When the infection is caused by fungi, especially from *Candida* species, it is harder to diagnose and treat, it usually leads to worse results compared to infections caused by bacteria. We describe a case of a 22-year-old man with chronic kidney disease on hemodialysis who came in with confusion and very high blood pressure. Blood tests from both the central venous catheter and from his peripheral blood showed growth of two types of *Candida*, namely *Candida tropicalis* and *Candida parapsilosis*, which confirmed the presence of a fungal CRBSI. An ultrasound of the heart showed a moving mass inside the heart attached to the tip of the catheter, which is a sign of a vegetative growth related to the catheter. Quick removal of the catheter and starting treatment with the antifungal medicine fluconazole helped improve his condition and cleared the infection. This case shows how important it is to diagnose early, remove the catheter quickly, perform an echocardiogram, and use the right antifungal treatment to manage fungal CRBSI and prevent serious complications.

**Keywords:** Catheter-related bloodstream infection, *Candida* species, CKD, Fluconazole.

## INTRODUCTION:

Catheter-related bloodstream infection (CRBSI) is a serious healthcare-associated infection caused by microbial colonization of intravascular catheters, leading to bacteremia or fungemia in the absence of an alternate infection source. Patients with chronic kidney disease (CKD) on maintenance hemodialysis are particularly vulnerable due to repeated vascular access, prolonged catheter use, immune dysfunction, and frequent hospital exposure<sup>[1]</sup>. CRBSI commonly presents with fever, chills, hemodynamic instability, altered sensorium, and laboratory evidence of systemic infection. Fungal CRBSI, especially due to *Candida* species, is associated with increased morbidity and mortality compared to bacterial infections<sup>[2]</sup>. Recent evidence and Infectious Diseases Society of America (IDSA) guidelines emphasize early identification, prompt catheter removal, initiation of targeted antifungal therapy based on culture sensitivity, and echocardiographic evaluation to rule out complications such as infective endocarditis or intracardiac vegetations, particularly in cases of persistent fungemia<sup>[3]</sup>. This case highlights a fungal catheter-related bloodstream infection complicated by intracardiac involvement in a young patient on maintenance hemodialysis. Early diagnosis, catheter removal, and targeted antifungal therapy resulted in favorable clinical outcome.

## CASE REPORT:

A 22-year-old male with a known history of chronic kidney disease on maintenance hemodialysis, systemic hypertension, and Alport syndrome presented with altered sensorium and severe hypertension (blood pressure 200/100 mmHg). On examination, the patient was drowsy with a Glasgow Coma Scale score of E4V5M6. Pulse rate was 72/min and respiratory rate was 16/min. Systemic examination was otherwise unremarkable. Laboratory investigations revealed elevated serum creatinine and blood urea consistent with end-stage renal disease, hyperkalemia, and raised inflammatory markers. Computed tomography of the brain showed no acute intracranial pathology.

Blood investigations revealed evidence of bloodstream infection. The blood cultures obtained from the central venous catheter and peripheral vein confirmed the presence of *Candida tropicalis* and *Candida parapsilosis*, both sensitive to fluconazole, confirming the diagnosis of fungal catheter-related bloodstream infection [4]. Transthoracic echocardiography demonstrated dilated cardiomyopathy with a freely mobile mass attached to the tip of the catheter in the right atrium, suggestive of possible catheter-related vegetation. The infected catheter was promptly removed for source reduction. Computed tomography of the brain showed no evidence of intracranial hemorrhage or raised intracranial pressure.

MICROBIOLOGY							
Test	C/S BLOOD -2 BOTTLE						
Investigation	AEROBIC CULTURE / SENSITIVITY						
Specimen	BLOOD						
Organisms Isolated :			Growth :				
1. CANDIDA TROPICALIS			CULTURE YIELDED CANDIDA. KINDLY CORRELATE CLINICALLY				
ANTIBIOTIC SENSITIVITY							
Antibiotic	MIC and Interpretation			Antibiotic	MIC and Interpretation		
	1	2	3		1	2	3
Amphotericin B	R			Caspofungin	R		
FLUCYTOSINE	R			Fluconazole	R		
MICAFUNGIN	R			Voriconazole	S		

\*Sensitivity Code :- R-Resistive,S-Sensitive,I-Intermediate Sensitive.

Fig: C/S blood report

2D & M-MODE		EDV(Teach)		MITRAL VALVE	
Ao Diam	3.1 cm	EDV(Teach)	194 ml	MV E Vel	1.13 m/s
LA Diam	4.8 cm	ESV(Teach)	116 ml	MV DecT	129 ms
LVAo	1.50	EF(Teach)	40 %	MV Dec Slope	8.8 m/s <sup>2</sup>
IVSd	1.0 cm	sv(S Teach)	78 ml	MV A Vel	0.78 m/s
LVIDd	6.2 cm			MV E/A Ratio	1.46
LVPVsd	1.2 cm			E'	0.09 m/s
IVSs	1.1 cm			E/E'	13.31
LVIDs	5.0 cm				
LVPVs	1.5 cm				
AORTIC VALVE		PULMONIC VALVE		TRICUSPID VALVE	
AV Vmax	1.89 m/s	PV Vmax	1.23 m/s	TR Vmax	3.70 m/s
AV maxPG	10.87 mmHg	PV maxPG	6.02 mmHg	TR maxPG	54.87 mmHg

**Echo Summary.**  
 LA/LV dilated.  
 Mid Global LV Hypokinesia.  
 No areas of thinning/scarring. LVEF~40-45%  
 Freely mobile mass attached to the tip of catheter in RA s/o possible vegetation.  
 AoV trileaflet. Mild AR. No AS.  
 AoV Moderate MR / TR RVSP-- 65mmHg.  
 Septae intact. Moderate-Severe PAH. Trivial PE post to RA  
 Imp. Dilated Cardiomyopathy.  
 Freely mobile mass attached to the tip of catheter in RA s/o possible vegetation.  
 Overall Mid LV systolic dysfunction.  
 Moderate-Severe PAH. Mid-Mod MR.

Fig: ECHO

## MANAGEMENT:

The patient was treated with fluconazole 400 mg iv once daily, adjusted according to renal function and hemodialysis schedule, followed by Tab. Fluconazole 200 mg p/o once daily along with supportive care and blood pressure control. Hypertensive emergency was managed with Tab. Amlodipine 5 mg once daily along with supportive care. The patient received inj. ceftriaxone 1 g IV BD, inj. vancomycin 1 g IV (renal-adjusted), Anemia was managed with inj. Eposis 4000 IU SC weekly and oral iron, and the patient underwent hemodialysis thrice weekly, with clinical stabilization.

Hemodialysis was continued via alternate access under strict aseptic precautions. The patient showed clinical improvement, with stabilization of blood pressure and resolution of symptoms. Repeated blood cultures were done and was sterile. He was discharged in a stable condition with advice to continue antifungal therapy, undergo regular hemodialysis and consider alternative vascular access creation to prevent recurrence. During discharge, the patient was advised Inj. Fluconazole 200 mg IV once daily for one more day, followed by Tab. Fluconazole 200 mg orally once daily. Antihypertensives included Tab. Arkamin 0.1 mg once daily and Tab. Cilacar 20 mg twice daily. Other medications prescribed were Tab. Sacurise 100 mg twice daily, Tab. Clonotril 0.25 mg at bedtime, Tab. Qfol once daily, Tab. Renum-SC 5 mg at bedtime, and Tab. Pantop 40 mg once daily. For anemia management, Inj. Eposis 4000 IU subcutaneously once weekly and Tab. Ferisome once daily were advised.

## DISCUSSION:

Fungal infections connected to catheters, though not as common as bacterial ones, can be very serious for people with chronic kidney disease who are on long-term hemodialysis. Raad I, et al in their research they have discussed that Those patients often need long-term access through catheters, which, along with a weakened immune system and repeated exposure to healthcare settings makes them more likely to get bloodstream infections. Marchetti O, Luder G, et al. have discussed that certain types of fungi, mainly *Candida parapsilosis* and *Candida tropicalis*, are becoming more common causes of these infections. These fungi can form strong biofilms on the surface of catheters, making them hard to treat with antifungal drugs and leading to repeated infections.<sup>[2]</sup> The way these fungal infections develop is closely tied to the formation of biofilms on the catheter. Biofilms help the fungi survive against the body's defenses and antifungal treatments, so it's important to use strong methods to get rid of them. Studies done by Gahlot, Rupam, et al- Catheter-Related Blood stream Infections. in the lab and with animals show that targeting biofilms like using echinocandin lock therapy and systemic treatment can greatly reduce the amount of fungus in the catheter. In particular, combining systemic micafungin with lock therapy has been shown to eliminate *C. parapsilosis* biofilms. Clinical guidelines consistently say that it's important to remove the catheter quickly if a fungal infection is suspected, whenever it's possible to do so. The IDSA guidelines suggest that for non-neutropenic patients with candidemia, central venous catheters should be removed early if the catheter is thought to be the source of the infection, along with using antifungal drugs. Early removal is important because keeping the infected catheter can lead to ongoing infections, complications like endocarditis, and higher chances of death.<sup>[5]</sup> For antifungal treatment, echinocandins are usually recommended as the first choice for candidemia in critically ill or unstable patients because they are effective against biofilm-related infections. In non-critically ill patients, fluconazole is often used, especially if the fungus is sensitive to azoles, after initial treatment with an echinocandin. When multiple fungal species are present like in this case, it shows how important the catheter is in causing the infection. Studies have found that having long-term central venous catheters increases

the risk of deeper infections, like endocarditis and it's important to do a full check such as an echocardiogram to make sure there's no spread of infection. Along with treating the infection, preventing it is key to reducing the number of fungal blood stream infections .This includes following strict infection control during catheter insertion and care checking regularly for signs of infection and planning for more permanent access options like arteriovenous fistulae to reduce the need for temporary catheters. Research shows that switching to permanent access can lower the risk of infections compared to long term catheters.<sup>[6,7]</sup>

This case follows the main points supported by clinical evidence: identifying the infection caused by the catheter, confirming it through cultures from both the catheter and the blood, finding a mobile mass in the heart that suggests infection, quickly removing the catheter and starting the right antifungal treatment which led to improvement.

These steps are in line with international guidelines aimed at reducing complications and increasing survival in patients with fungal bloodstream infections from catheters.

## CONCLUSION :

Fungal infections that spread into the bloodstream through a catheter are a serious and sometimes deadly problem for patients who are on long-term hemodialysis. Recognizing these infections early, removing the catheter quickly, using the right antifungal medicine, and doing an echocardiogram are key steps in improving patient outcomes. This case shows how important it is to be more watchful for fungal infections in patients with catheters who have sepsis that can't be explained, and it also shows why taking steps to prevent catheter-related problems is especially important for those at higher risk.

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