

Candida Parapsilosis Endocarditis in a Patient with MitraClip®: A Case Report

Shahnawaz Notta, DO^{1*}, Nasir Notta, MD², Hezborn Magacha, MD¹, Sean Moore, MD¹, Joel Danisi, MD¹

¹East Tennessee State University, Quillen College of Medicine, TN, USA

²The University of Tennessee Graduate School of Medicine, TN, USA

DOI: <https://doi.org/10.36347/sjmcr.2025.v13i02.011>

| Received: 27.12.2024 | Accepted: 04.02.2025 | Published: 19.02.2025

*Corresponding author: Shahnawaz Notta, DO

East Tennessee State University, Quillen College of Medicine, TN, USA

Abstract

Case Report

Fungal endocarditis is an uncommon form of endocarditis that is increasing in incidence. Our case involves a 73-year-old male with MitraClip® receiving chronic fluconazole therapy. The patient presented to the emergency department due to left upper quadrant abdominal pain. Imaging suggested splenic infarct, so there was concern for emboli; however, transthoracic echocardiography did not reveal valvular vegetations on the areas visualized. The patient had a history of fungemia, so blood cultures were obtained prior to starting prophylactic antifungal therapy. The blood cultures revealed *Candida parapsilosis*, and transesophageal echocardiography revealed valvular vegetations. The antifungal regimen was modified, and the patient was referred to an outside facility for surgical evaluation. At the outside facility, the patient underwent mitral valve replacement, tricuspid valve repair, and splenectomy. Surgical pathology confirmed *Candida parapsilosis*. The fungus was also found in the patient's spleen. The patient then completed an antifungal regimen while inpatient. He is taking a suppressive regimen of fluconazole currently. To our knowledge, this is the first case of *Candida parapsilosis* endocarditis in a patient with MitraClip® receiving chronic fluconazole therapy.

Keywords: Fungal endocarditis, *Candida parapsilosis*, MitraClip, Fluconazole, Splenic infarct.

Copyright © 2025 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

Fungal endocarditis (FE) is a relatively uncommon and challenging form of endocarditis, making up a modest percentage of infectious endocarditis cases, ranging from 1.3% to 6% [1]. While *Candida albicans* has historically been recognized as a common causative agent, the landscape is evolving, with *Candida parapsilosis* emerging as a prevalent non-*albicans* species associated with this condition [1].

In recent years, there has been a notable increase in the incidence of FE, with the prevalence now ranging from 2% to 5% of infectious endocarditis cases [1]. This shift in epidemiology underscores the dynamic nature of fungal infections affecting the cardiovascular system [1]. Amid this backdrop, we present a rare and noteworthy case of *Candida parapsilosis* endocarditis. This case serves as a valuable addition to the medical literature, offering insights into the changing patterns of fungal pathogens implicated in cardiovascular infections. By highlighting this unique instance of *Candida parapsilosis* endocarditis, we contribute to a deeper understanding of the complexities associated with fungal endocarditis, emphasizing the need for ongoing

research and vigilance in diagnosing and managing these challenging infections within the realm of cardiovascular health.

CASE REPORT

Our patient is a 73-year-old male with history of heart failure with reduced ejection fraction ranging between 35-40%, paroxysmal atrial fibrillation, non-ischemic cardiomyopathy, and thoracic aortic aneurysm. He also had a myxomatous mitral valve and flail posterior leaflet causing severe mitral regurgitation; this required mitral valve repair involving MitraClip® (Abbott Vascular; Santa Clara, CA, USA) three years and five months prior to presentation. His history is notable for episodes of fungemia with *Candida parapsilosis* that occurred in months five and six after the mitral valve procedure. The source of the fungemia remains unknown. Since then, his medication regimen has consisted of 400 mg of oral fluconazole daily as prophylaxis for candidemia.

The patient presented to the hospital following advice from his primary care physician due to worsening left upper quadrant abdominal pain. Upon presentation,

Citation: Shahnawaz Notta, Nasir Notta, Hezborn Magacha, Sean Moore, Joel Danisi. *Candida Parapsilosis Endocarditis in a Patient with MitraClip®: A Case Report*. Sch J Med Case Rep, 2025 Feb 13(2): 263-266.

his temperature was 96.9 °F, blood pressure was 112/80 mmHg, and heart rate was 62 beats per minute. Initial laboratory values are seen in Table 1. Computed tomography revealed wedge-shaped features suggestive of a splenic infarct, raising concerns about septic emboli. A transthoracic echocardiogram demonstrated reduced ejection fraction but did not find any obvious valvular vegetations on the portions of the valves visualized. Given his history of candidemia, the infectious diseases team was consulted and initiated the patient on a treatment regimen consisting of daptomycin 500 mg every 24 hours, cefepime 1 g every 8 hours, and micafungin 100 mg every 24 hours.

On hospital day 3, blood cultures identified *Candida parapsilosis* fungemia. The antifungal regimen became 100 mg of intravenous micafungin every 24 hours and 200 mg of oral voriconazole every 12 hours. A transesophageal echocardiogram identified highly mobile shaggy mass lesions in association with the atrial surface of the anterior mitral leaflet. The longest mass was 1.1 cm. A vegetation is indicated by the arrow in Figure 1. The patient was referred to an outside facility for surgical evaluation.

After being transferred to the outside facility, the patient underwent open heart surgery for clip removal, mitral valve replacement, and tricuspid valve repair. Surgical pathology of the mitral valve demonstrated *Candida parapsilosis*. The patient underwent left atrial appendage ligation and splenectomy as well. Fungal presence was noted in the spleen. While at the outside facility, he was treated with amphotericin B and flucytosine.

After receiving appropriate care in the outside facility, he was transferred to a local facility, where his transthoracic echocardiogram demonstrated normal function of the prosthetic mitral valve and repaired tricuspid valve, with mildly reduced left ventricular ejection fraction (LVEF) of 40-45%. While at the local facility, his antifungal regimen consisted of caspofungin, fluconazole, and flucytosine. He then was started on a suppressive course of fluconazole, to be continued as an outpatient.

DISCUSSION

Patients with prosthetic implants or valves are at increased risk of infection with *Candida parapsilosis* [2]. The mitral and aortic valves are most frequently impacted, as they are the most likely to have been manipulated, such as through operations [2].

The risk of infection is thought to be lower than that of conventional surgical prosthesis in general. Infectious endocarditis can still occur post-implantation [3]. In the EVEREST II study, infective endocarditis (IE) occurred in 1.1% of patients within a 12-month follow-up period, although other studies estimate this risk to

vary from 0 to 1.3% [4,5]. Because of the rising rates of MitraClip® implantation, the real impact may be greater [6]. There is also a need for this in view of undefined recommendations for its detection and treatment [7]. Studies have recently found that this may be related to the fact that the patients affected by IE are typically between 60 and 68 years old [8].

The procedure is usually done on older patients, most of whom have significant medical comorbidities and are poor candidates for open-heart and valve replacement; [9] thus, the age median of patients who experience MitraClip® related IE is higher [10]. Due to the older age bracket, post-MitraClip® implantation significantly affects the mortality rate of IE as a whole [11]. Comorbidities are therefore more common in this category, partly explained by older age [5]. It should be underlined that cases of MitraClip® IE seldom experience embolic problems. Indeed, in typical IE patients, embolic events occur in 20%-50% of cases [5].

Patients with *Staphylococcus aureus* infections and vegetation diameters > 10 mm are at increased risk for embolic events [12]. Both of these features are common in IE associated with MitraClip® [13]. Their older age and the use of anti-thrombotic drugs post-implantation may be factors in their low risk for embolism [13]. Of note, the majority of IE related to MitraClip® have been reported within a year following device implantation, supporting the fact that most of the infections are acquired during the procedure [5]. Presently, there are no consensus publications or standard setting for the management of MitraClip® associated IE [5]. Considering the associated clinical circumstances, hemodynamic stability, and preoperative risk, the best action to be undertaken for IE associated with MitraClip® should be determined [13].

Fungal endocarditis has high levels of morbidity and mortality, so early diagnosis and treatment are important [14]. In addition to blood cultures, detection of mannan antigen can help aid the diagnosis of candidemia [14]. Echocardiography can help identify lesions, which are usually large and commonly visualized on the left side of the heart [14]. Compared to the trans-thoracic modality, trans-esophageal echocardiography has better sensitivity and specificity [14].

Treatment of *Candida* infections with antifungals is considered to be effective [15]. In patients who are not neutropenic, treatment with an echinocandin – such as micafungin – is strongly recommended as the initial therapy [16]. This class of antifungals is considered to be fungicidal and effective within biofilms [17]. Voriconazole is an appropriate therapy for candidemia, as well [16]. While voriconazole does not provide extra advantages over fluconazole, [16]. our patient developed a *Candida* infection while receiving prophylactic fluconazole. For patients who have

previously received echinocandin therapy for *Candida parapsilosis*, it is important to consider echinocandin sensitivity testing [16].

Indications for surgery in patients with infective endocarditis include heart failure, persistent infection, reduction of the risk of embolism, and endocarditis impacting prosthetic valves [18].

Cases of reported infective endocarditis associated with MitraClip® have involved *Staphylococcus aureus*, *Streptococcus* species, *Enterococcus faecalis*, *Bartonella haenselae*, *Streptococcus oralis*, coagulase-negative *Staphylococci*, *Abiotrophia* species, *Corynebacterium* species, *Pseudomonas aeruginosa*, or *Streptococcus gordonii* [5]. To our knowledge, our case is the first to describe *Candida parapsilosis* endocarditis in a patient with mitral valve clip receiving chronic prophylactic fluconazole therapy.

CONCLUSION

Although fungal endocarditis is relatively uncommon, it is an important differential diagnosis to consider in patients with MitraClip®. Treatment with echinocandin antifungal agents is considered to be an effective option. In some patients, however, surgical intervention may be required.

REFERENCES

- Jain, A. G., Guan, J., & D'Souza, J. (2018). *Candida parapsilosis*: an unusual cause of infective endocarditis. *Cureus*, 10(11). doi: 10.7759/cureus.3553.
- Mamtani, S., Aljanabi, N. M., Rauniyar, R. P. G., Acharya, A., & Malik, B. H. (2020). *Candida* endocarditis: a review of the pathogenesis, morphology, risk factors, and management of an emerging and serious condition. *Cureus*, 12(1). doi: 10.7759/cureus.6695.
- Feldman, T., Foster, E., Glower, D. D., Kar, S., Rinaldi, M. J., Fail, P. S., ... & Mauri, L. (2011). Percutaneous repair or surgery for mitral regurgitation. *New England Journal of Medicine*, 364(15), 1395-1406.
- von Bardeleben, R. S., Hobohm, L., Kreidel, F., Ostad, M. A., Schulz, E., Konstantinides, S., ... & Keller, K. (2019). Incidence and in-hospital safety outcomes of patients undergoing percutaneous mitral valve edge-to-edge repair using MitraClip: five-year German national patient sample including 13,575 implants. *EuroIntervention*, 14(17), 1725-1732. doi:10.4244/EIJ-D-18-00961.
- Bertolino, L., Ramadan, M. S., Zampino, R., & Durante-Mangoni, E. (2023). Infective endocarditis involving MitraClip® devices: a systematic literature review. *Infection*, 51(5), 1241-1248. doi: 10.1007/s15010-023-02067-y.
- Fedeli, U., Schievano, E., Buonfrate, D., Pellizzer, G., & Spolaore, P. (2011). Increasing incidence and mortality of infective endocarditis: a population-based study through a record-linkage system. *BMC infectious diseases*, 11, 1-7. doi:10.1186/1471-2334-11-48.
- Durante-Mangoni, E., Bradley, S., Selton-Suty, C., Tripodi, M. F., Barsic, B., Bouza, E., ... & International Collaboration on Endocarditis Prospective Cohort Study Group. (2008). Current features of infective endocarditis in elderly patients: results of the International Collaboration on Endocarditis Prospective Cohort Study. *Archives of internal medicine*, 168(19), 2095-2103. doi: 10.1001/archinte.168.19.2095.
- McDonagh, T.A., Metra, M., Adamo, M., Gardner, R.S., Baumbach, A., ... & Böhm, M. (2021). 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure. *Eur Heart J*. doi: 10.1093/eurheartj/ehab368.
- Habib, G., Lancellotti, P., Antunes, M. J., Bongiomi, M. G., Casalta, J. P., Zotti, F. D., ... & Zamorano, J. L. (2016). 2015 ESC Guidelines for the management of infective endocarditis. *Revista Española de Cardiología*, 69(1). doi: 10.1093/eurheartj/ehv319.
- Mangoni, E. D., Adinolfi, L. E., Tripodi, M. F., Andreana, A., Gambardella, M., Ragone, E., ... & Ruggiero, G. (2003). Risk factors for "major" embolic events in hospitalized patients with infective endocarditis. *American heart journal*, 146(2), 311-316. doi: 10.1016/S0002-8703(02)94802-7.
- Rizzi, M., Ravasio, V., Carobbio, A., Mattucci, I., Crapis, M., Stellini, R., ... & Investigators of the Italian Study on Endocarditis. (2014). Predicting the occurrence of embolic events: an analysis of 1456 episodes of infective endocarditis from the Italian Study on Endocarditis (SEI). *BMC Infectious Diseases*, 14, 1-10. doi: 10.1186/1471-2334-14-230.
- Thuny, F., Disalvo, G., Belliard, O., Avierinos, J. F., Pergola, V., Rosenberg, V., ... & Habib, G. (2005). Risk of embolism and death in infective endocarditis: prognostic value of echocardiography: a prospective multicenter study. *Circulation*, 112(1), 69-75. doi: 10.1161/CIRCULATIONAHA.104.493155.
- Hohmann, C., Ludwig, M., Walker, J., Iliadis, C., Schipper, J. H., Baldus, S., & Pfister, R. (2022). Real-world anticoagulatory treatment after percutaneous mitral valve repair using MitraClip: a retrospective, observational study on 1300 patients. *Clinical Research in Cardiology*, 111(8), 889-899. doi: 10.1007/s00392-022-01988-2.
- Ojha, N. & Dhamoon, A.S. (2023). Fungal Endocarditis. [Updated 2023 Aug 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK532987/>

15. Qin, J., Yang, H., Shan, Z., Jiang, L., & Zhang, Q. (2021). Clinical efficacy and safety of antifungal drugs for the treatment of *Candida parapsilosis* infections: A systematic review and network meta-analysis. *Journal of Medical Microbiology*, 70(10), 001434. doi: 10.1099/jmm.0.001434.
16. Pappas, P. G., Kauffman, C. A., Andes, D. R., Clancy, C. J., Marr, K. A., Ostrosky-Zeichner, L., ... & Sobel, J. D. (2016). Clinical practice guideline for the management of candidiasis: 2016 update by the Infectious Diseases Society of America. *Clinical infectious diseases*, 62(4), e1-e50. doi: 10.1093/cid/civ933.
17. Garzoni, C., Nobre, V. A., & Garbino, J. (2007). *Candida parapsilosis* endocarditis: a comparative review of the literature. *European journal of clinical microbiology & infectious diseases*, 26, 915-926. doi: 10.1007/s10096-007-0386-1
18. American College of Cardiology. Recommendations for Surgical Treatment of Infective Endocarditis, <https://www.acc.org/Latest-in-Cardiology/ten-points-to-remember/2022/05/09/19/39/Current-Recommendations-and-Uncertainties>; 2022 [accessed 19.01.24]