

## Post-cardiac Catheterization Infective Endocarditis with Flail Mitral Valve Leaflets: A Rare Case

Mohamud Mire Waberi<sup>1</sup>, Mohamed Omar Hassan<sup>1</sup>, Abdijalil Abdullahi Ali<sup>2</sup>, Ishak Ahmed Abdi<sup>1</sup>, Ahmed Elmi Abdi<sup>1</sup>, Said Abdirahman Ahmed<sup>1</sup>

<sup>1</sup>Department of Cardiology, Mogadishu Somali Turkish Training and Research Hospital, Mogadishu, Somalia.

<sup>2</sup>Department of Cardiovascular Surgery, Mogadishu Somali Turkish Training and Research Hospital, Mogadishu, Somalia.

**Corresponding Author** Mohamud Mire Waberi **Email:** xusen7777@hotmail.com  
**Received** August 10<sup>th</sup>, 2023  
**Accepted** September 30<sup>th</sup>, 2023

**Abstract** Infectious endocarditis (IE) occurs after colonizing the cardiac endocardium by virulent microorganisms, usually bacteria. Infective endocarditis causes significant morbidity and mortality, even in this era of antibiotics. Here, we present a 52-year-old male patient with hypertension and ischemic heart disease who presented with shivering, fever, and confusion for two days, fourteen days after percutaneous coronary intervention (PCI). On further assessment, transesophageal echocardiography was done due to the patient's fulfillment of 3 minor and 1 major of Duke's criteria. The transesophageal echocardiography observed a flail posterior mitral valve leaflet of 1.1x0.60cm vegetation and severe eccentric mitral regurgitation.

Post-PCI infective endocarditis is a rare and missed diagnosis, so it should be a high suspicion for those present with signs and symptoms compatible with infective endocarditis.

**Keywords** Percutaneous coronary intervention; Infective endocarditis; Vegetation; Echocardiography; Mitral regurgitation

### Introduction

Infective endocarditis (IE) is a rare and life-threatening infection of the endocardium (inner lining of the heart). In decreasing order, the most commonly affected valves are the mitral, aortic, combined mitral-and-aortic, tricuspid, and pulmonic valves (1). In the past 30 years, IE incidence and mortality have risen, especially in areas with higher socio-demographic index (SDI) regions (2). Staphylococcus aureus is the most frequent cause in high-income countries, accounting for up to 40% of cases due to epidemiological reasons (3). There has been a considerable change in the

epidemiology and clinical characteristics of IE during the past ten years. Post-surgical and interventional IE incidence increased significantly (4). The most frequent complication of endocarditis is ischemic stroke. About 20% with infective endocarditis develop ischemic stroke. Patients with commitment cardiomyopathy have a higher risk of AIS (5, 17).

We present a rare case of infective endocarditis with a flail mitral valve leaflet with post-cardiac catheterization.

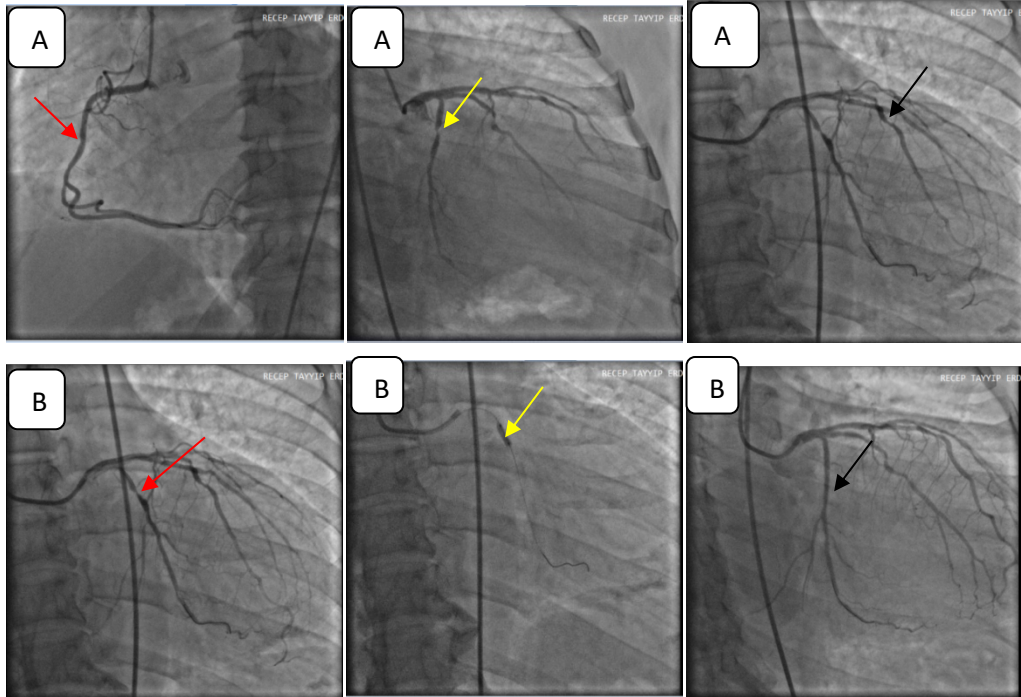
### **Case presentation**

A 52-year-old man with hypertension and ischemic heart disease complains of exertional chest pain, shortness of breath (SOB), and fatigue. The vitals were normal. Basic laboratory tests of complete blood count, thyroid, liver, and renal function tests were normal, while electrocardiography showed lateral ST depression of v6 and v7, otherwise normal sinus rhythm. An echocardiogram demonstrated mild mitral regurgitation (MR) with apical hypokinesia. Diagnostic angiography was performed due to unstable angina with 40% diagonal bifurcation, 99% circumflex (CX), and plaque in the right coronary artery (RCA). The circumflex (CX) was opened with 2.5x15mm DES at 12 atm and post-dilated with a 2.5x20 NC balloon (Figure 1).

The patient was monitored at the coronary care unit for 24 hours before being discharged on day 2 with the following medications: aspirin 100mg, clopidogrel 75mg, atorvastatin 40mg, metoprolol 25mg BID, and ramipril 2.5mg twice a day.

Fourteen days later, the patient was taken back to the hospital because he had shivering, a fever, and was disorientated for two days. On systemic review, he was confused but otherwise normal, while he has S3 on auscultation of his cardiopulmonary. On abdominal examination, he had mild left upper quadrant pain. Basic laboratory test results were normal, except elevated white blood cell count (15.39x1000/mm<sup>3</sup>), neutrophil (13.51x1000/mm<sup>3</sup>), C-reactive protein (65 mg/l),

creatinine (2.61 mg/dL), and urea (130 mg/dL). The chest X-ray revealed vascular congestion compatible with pulmonary edema. Abdominal ultrasound revealed splenic microinfarct.



**Figure 1.** Coronary angiography **a.** RCA with plaque (red arrow), 90% CX (yellow arrow) and occluded 40% diagonal (black arrow). **b.** Wiring of CX (red arrow), at Ballooning (yellow arrow), and final image (black arrow) On the third day of his readmission, the patient developed a decreased level of consciousness and right hemiparesis. Non-contrast brain MRI showed multiple cortical embolic infarcts of the brain (Figure 2).

For further investigation of the source of infection, transthoracic echocardiography showed 1.1x0.60cm vegetation of the mitral valve with severe eccentric mitral regurgitation and a dilated left atrium (43mm). In addition, transesophageal echocardiography demonstrated a flail posterior mitral valve, 1.1x0.60cm vegetation, and severe mitral regurgitation (Figure 3).

While waiting for the blood culture, vancomycin and gentamycin were started as empirical therapy based on hospital policy. On day one of blood cultures and seven days later, the results were all

negative. Because our hospital lacks valvular surgery capacity, the patient was referred to a cardiovascular surgeon.

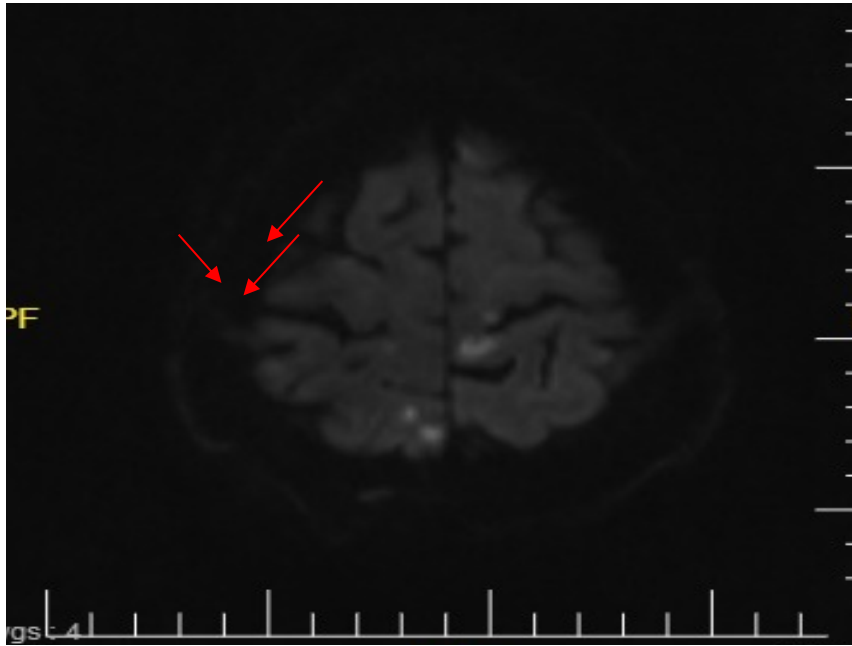
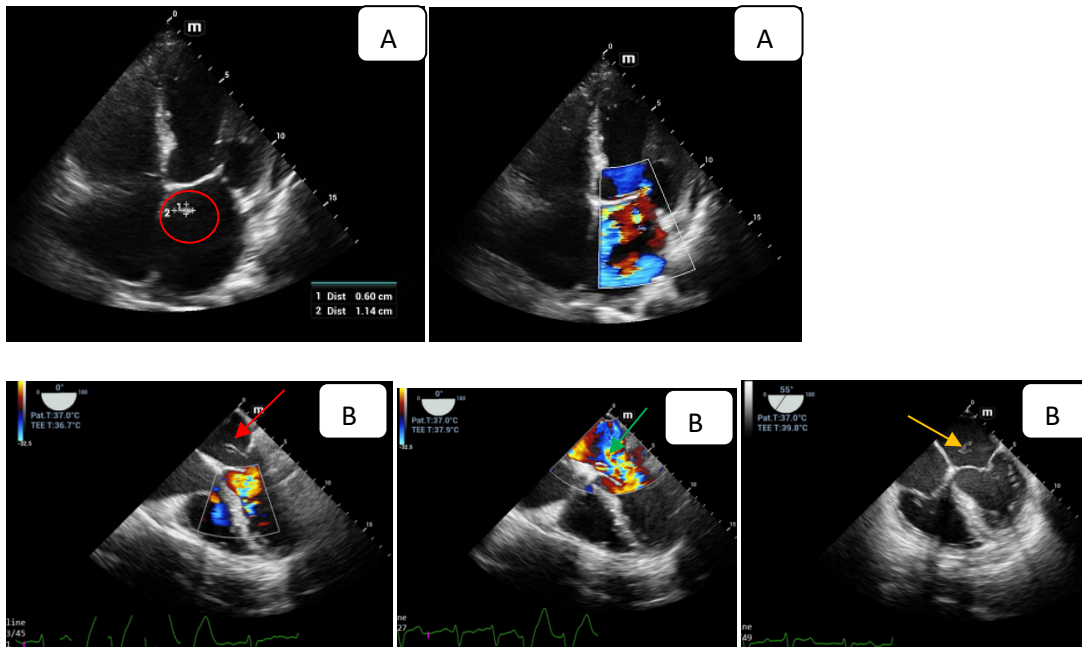


Figure 2. Brain MRI showed multiple cortical embolic infract of the brain (red arrow)



**Figure 3: A:** trans-thoracic echo with mass (1.1x0.60cm) near anterior mitral valve (red circle), flail posterior leaflet, and severe eccentric mitral regurgitation (red arrow). **B:** transesophageal echocardiography demonstrated flail mitral valve (red arrow), severe mitral regurgitation (green arrow), and vegetation (yellow arrow).

### Discussion

A bacterial infection of the endocardium known as infectious endocarditis is usually brought on by colonization of streptococci or staphylococci. Fever (90%) and heart murmurs (81%) are the most common presenting symptoms of infectious endocarditis, followed by dyspnea (42.9%) (5). The growing incidence of congenital heart disease, the need for frequent medical care for other co-morbidities, hemodialysis, immunosuppression, and the use of intravenous drugs are all current risk factors for endocarditis (6). After cardiac catheterization and percutaneous coronary artery angioplasty, septic complications are pretty rare (7). In a prospective study, only 0.4% of 960 patients who underwent cardiac catheterization generated positive blood cultures significantly correlated with cardiac catheterizations and percutaneous coronary interventions (8). In our case, although we have adapted the sterilization system of our hospital, he has no risk factor for anything other than cardiac catheterization. According to the infectious endocarditis guidelines, antibiotic prophylaxis is not recommended prior to performing cardiac catheterization, even in high-risk patients (9). Infective endocarditis has many complications, including renal and neurological complications, perivalvular abscess, metastatic infection, septic embolization, and mycotic aneurysms. Acute, sub-acute, or chronic mitral regurgitation can cause mitral leaflet Flail, a rare IE complication, and about 50% of these patients with acute MLF experience sudden onset dyspnea (10). This case presented with acute dyspnea due to a flail posterior mitral valve leaflet with septic embolization of the brain and spleen.

Although infective endocarditis (IE) is rare, it still has high morbidity and mortality. In 267 individuals with definite or possible IE, sepsis (n = 23, 46%), multi-organ failure (n = 8, 16%), heart failure (n = 4, 16%), and sudden death (n = 4) were the primary causes of mortality (11).

Although transthoracic echocardiography is an excellent tool for diagnosing infective endocarditis, about 50% of clinical suspicion of endocarditis is high (12), but it still has a downside. Factors that may increase the downside of TTE include the absence of Staphylococcal bacteremia and fungemia, as well as cultures of negative etiologies (13).

According to the modified European Society of Cardiology Duke criteria, transesophageal echocardiography (TEE) performed better than CT for the detection of valvular IE-related lesions and similarly to CT for the detection of paravalvular IE-related lesions in patients with a confirmed diagnosis of left-side IE (14). Based on his Duke criteria, he had 3 minor and 1 major: echocardiography findings, fever, glomerulonephritis, and embolic infarct of brain and spleen. Diffusion-weighted MRI (DWI) should be done for all patients with infective endocarditis who develop neurological deficits. The DWI is more sensitive to detect acute ischemic stroke than CT and may show tiny infarcts in cortical, deep cerebral structures and the posterior fossa (15, 16). In this case, DWI showed multiple diffusion restrictions in both cerebral hemispheres, consistent with acute infarct.

Early surgical treatment, especially in high-risk patients, decreases mortality in patients with insufficient antibiotics to eliminate bacterial infection. However, many types of vegetation observed on TEE may still be missed by modern harmonic TTE (15,17).

## **Conclusion**

Early suspicion of infective endocarditis should be considered for patients with fever after PCI. Therefore, transthoracic echocardiography should be performed on all patients with suspected infective endocarditis, and most of these patients should also have a TEE assessment.

## Informed consent

Written informed consent was obtained from the patient for publishing the included data.

## References

1. Meidrops K, Burkhardt FJ, Osipovs JD, Petrosina E, Groma V, Stradins P. Etiology, Risk Factors and Clinical Outcomes in Infective Endocarditis Patients Requiring Cardiac Surgery. *J Clin Med* 2022;11:1957.
2. Yang X, Chen H, Zhang D, Shen L, An G, Zhao S. Global magnitude and temporal trend of infective endocarditis, 1990–2019: results from the Global Burden of Disease Study. *Eur J Prev Card* 2022;29:1277-1286.
3. Wang A, Gaca JG, Chu VH. Management considerations in infective endocarditis: a review. *JAMA* 2018;320:72-83.
4. Wang P, Lu J, Wang H, et al. Clinical characteristics of infective endocarditis: analysis of 368 cases. *Zhonghua xin xue Guan Bing za zhi* 2014; 42:140-144.
5. Ahmed SA, Karataş M, Öcal L, et al. Isolated left ventricular non-compaction cardiomyopathy complicated by acute ischemic stroke: A rare case report. *Annals Med Surg* 2022; 81:104543.
6. Ba DM, Mboup MC, Zeba N, et al. Infective endocarditis in Principal Hospital of Dakar: a retrospective study of 42 cases over 10 years. *Pan Afr Med J* 2017;26.
7. Mostaghim AS, Lo HY, Khardori N. A retrospective epidemiologic study to define risk factors, microbiology, and clinical outcomes of infective endocarditis in a large tertiary-care teaching hospital. *SAGE Open Med* 2017;5:2050312117741772.
8. McCready RA, Siderys H, Pittman JN, et al. Septic complications after cardiac catheterization and percutaneous transluminal coronary angioplasty. *J Vasc Surg* 1991;14:170-174.
9. Banai S, Selitser V, Keren A, et al. Prospective study of bacteremia after cardiac catheterization. *Am J Cardiol* 2003;92:1004-1007.
10. Jayasuriya S, Movahed MR. Infectious endocarditis with systemic septic embolization as a rare complication of cardiac catheterization. *Exp Clin Cardiol* 2009;14: e17.

11. Ahmed R, Moaddab A, Graham-Hill S. Mitral Leaflet Flail as a Late Complication of Infective Endocarditis: A Case Report. *Cureus* 2022;14(6):e25854.
12. Chu VH, Cabell CH, Benjamin Jr DK, et al. Early predictors of in-hospital death in infective endocarditis. *Circulation* 2004;109(14):1745-1749.
13. Evangelista A, Gonzalez-Alujas MT. Echocardiography in infective endocarditis. *Heart* 2004;90:614-617.
14. Kini V, Logani S, Ky B, et al. Transthoracic and transesophageal echocardiography for the indication of suspected infective endocarditis: vegetations, blood cultures and imaging. *J Am Soc Echocardiogr* 2010;23:396-402.
15. Sifaoui I, Oliver L, Tacher V, et al. Diagnostic performance of transesophageal echocardiography and cardiac computed tomography in infective endocarditis. *J Am Soc Echocardiogr* 2020;33:1442-1453.
16. Abdi IA, Karataş M, Abdi AE, Hassan MS, Mohamud MF. Simultaneous acute cardio-cerebral infarction associated with isolated left ventricle non-compaction cardiomyopathy. *Annals Med Surg* 2022;80:104172.
17. Hassan MS, Sidow NO, Adam BA, Adani AA. Superior alternating hemiplegia (Weber's syndrome)-Case report. *Annals Med Surg* 2022;77:103674.