

## Infective Endocarditis after Transcatheter Mitral Valve Replacement on Top of Biological Mitral Valve: A Case Report

Yasser Shaban Mohamed Mubarak<sup>1,2,3 \*</sup>

<sup>1</sup> Cardiothoracic Surgery Department, Faculty of Medicine, Minia University, Egypt.

<sup>2</sup> Madinah Cardiac Center, Adult Cardiac Surgery Department, Madinah, Saudi Arabia.

<sup>3</sup> King Salman Heart Center, King Fahd Medical City, Adult Cardiac Surgery Department, Riyadh, Saudi Arabia.

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### ABSTRACT

Infective endocarditis (IE) is lethal complications in spite of advanced antibiotics. Prosthetic valve endocarditis (PVE) complications are dehiscence, paravalvular leak, perivalvular abscess, heart failure, persistent fever, positive blood culture and presence of vegetation. Therefore, the diagnosis is confirmed by clinical findings, blood cultures, and echo data according to Duke's criteria. Surgery in those cases are life-saving when indicated, despite it carries high risk mortality especially after stroke.

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### Introduction

Infective endocarditis (IE) is a serious and catastrophic complication after valve replacement (1). Transcatheter intervention by device carries risk of infective endocarditis in cases of ventricular septal defect (VSD), atrial septal defect (ASD), and patent ductus arteriosus (PDA) closure, paravalvular leak blockage, and valve implantation (2). Transcatheter VSD device closure is safe, however, it may be complicated by IE needing surgical intervention and aortic valve replacement (3).

Surgical replacement of infected valve and aggressive debridement is the standard management with long term intravenous (IV) antibiotics according to culture results. Fungal endocarditis is very rare, in which surgical intervention is indicated. It also requires long term antifungal therapy and is associated with a worse prognosis (4). Our case is a very rare fungal infection endocarditis of transcatheter valve in a valve at mitral position.

### Case Description

A 47-year-old lady was admitted to cardiology department as a case of infective endocarditis. She is a patient with systemic

\*Corresponding Author: Yasser Mubarak. Cardiothoracic Surgery Department, Faculty of Medicine, Minia University. Tel: +966560708223; +201002554078. E-mail: yassermubarak73@gmail.com.

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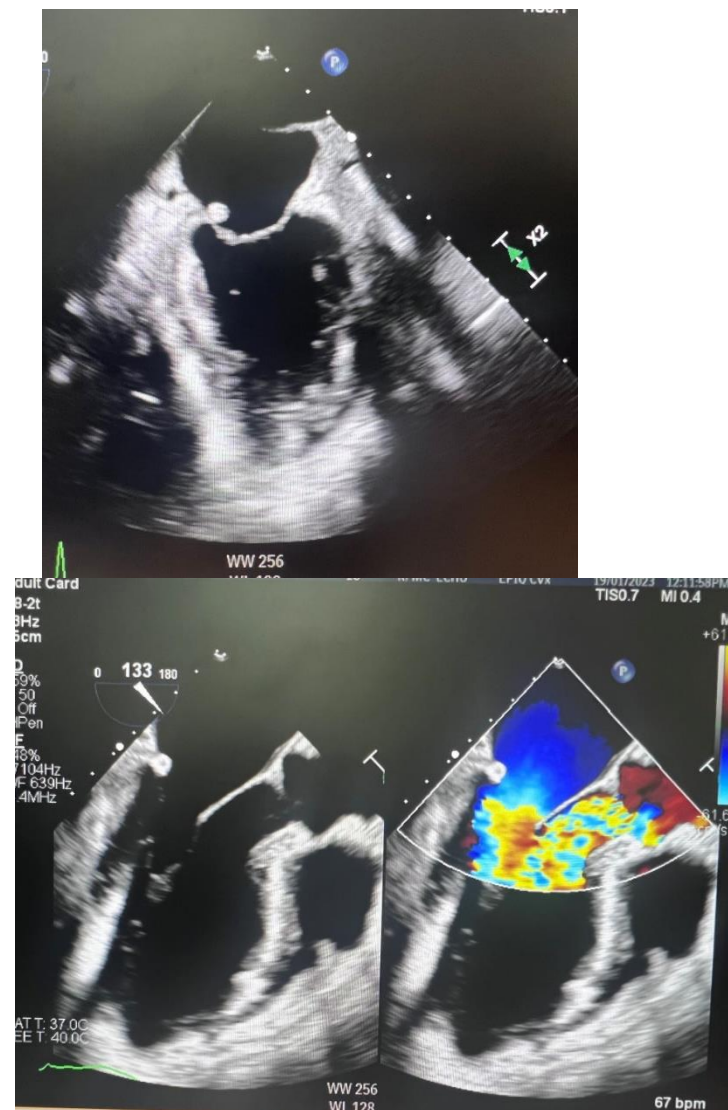
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lupus erythromatosus (SLE) under rheumatological follow up and medications. She has a previous history of mitral valve replacement (MVR) with biological valve [Mosaic mitral valve bioprosthesis] performed 9-years ago, then re-intervention due to valve stenosis [structural valve failure] by transcatheter valve-in-valve implantation [SAPIEN 3 transcatheter heart valve] 2-years ago.

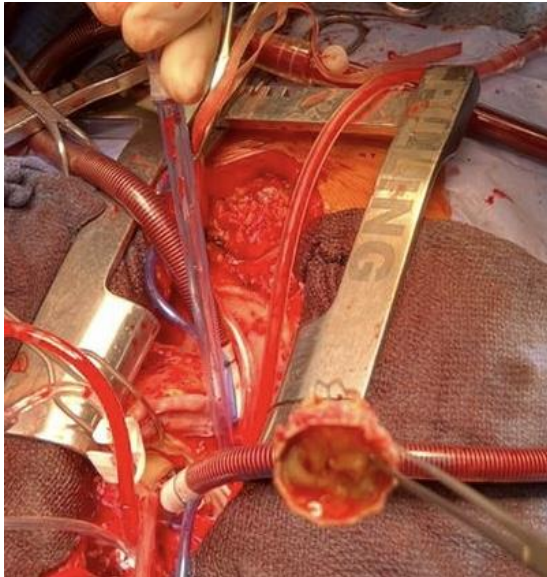
Her main medical history was a fever not response to antibiotics. Septic screen was done. Three blood cultures were taken which demonstrated fungal infestation [candida albicans] and Amphotericin B was given. Fungal endocarditis may be occurred due to low immunity due to SLE and its medications. Transthoracic echocardiography (TTE) revealed vegetation 1.6 cm on atrial side of mitral valve with moderate to severe mitral stenosis. Figure (1) Lateral chest x-ray was done to show sternal wires and relation of heart to sternum. Chest computerized tomographic (CT) scan was done to show the distance between ascending aorta and sternum, and extended to determine size of femoral arterial for possible femoral cannulation. She was afebrile and her blood cultures were negative.

Under general anesthesia, standard median sternotomy was performed using oscillating saw with exposure of femoral area for possible cannulation. All vital signs were connected and monitored [electrocardiography (ECG), blood pressure (BP), central venous pressure, Temperature, brain oxygenation, saturation]. Heparin was given and suitable activated clotting time (ACT) was confirmed. After removal of sternal wires and dissection, aortic and selective venous cannulation was performed. Antegrade cold cardioplegia, moderate systemic hypothermia 32°C was followed. after snugging of superior vena cava (SVC) and inferior vena cava (IVC), left atriotomy was performed. Extraction of SAPIEN valve was done after application of cold iced saline until shrunken was removed from inside biological valve. Figure (2) Subsequently, removal of biological valve was performed as a case of redo. Both valves and swap were sent for culture. Figure (3) Bioprosthetic mitral valve was inserted after sizing and sutures were taken, and then were tied with knot core.

Intraoperative Transesophageal echo (TEE) was used to assess function of heart, mechanical valve and de-airing. Smooth weaning from cardiopulmonary bypass (CPB) was done and the course of hospital stay was uneventful. Mitral valve was replaced by a mechanical mitral valve (On-x size 29). The following treatment plan consisted of a Complete course of amphotericin B (2.7 gm iv) followed by itraconazole (400 mg po od) and flucytosin (10 gm po od) for 6 months. The course of antifungal and antibiotics was completed after hospital discharge under home-health care through peripherally inserted central catheter (PICC) line. Follow up visits were planned to adjust dose of warfarin as may interact with SLE medications.



**Figure 1.** Vegetation at atrial side of bioprosthetic mitral valve.



**Figure 2.** Extraction of SAPIEN valve from bioprosthetic mitral valve.

### Discussion

Management of fungal endocarditis remains a challenging issue. A combined medical treatment and surgical intervention are the standard management. Especially, surgical intervention remains the gold standard. However, despite of advancement in surgical techniques and presence of new effective antifungal agents, the mortality rate remains considerably high. Surgery for native IE and PVE may be performed with acceptable outcomes at experienced centers. PVE patients have more hospital mortality, and lower long-term survival than native valve IE. Complications consist of stroke, Reinfection, dehiscence, and paravalvular leak (5).

In younger patients with native valve IE is replaced with mechanical valves. However, in patients more than 60 years old, it is replaced with bioprosthetic valves due to their limited life expectancy (6). Therefore, we decided to perform MVR with bioprosthetic valve after discussing with the patient and accepting the risk of a redo later on. As we prefer to replace with biological valve in cases of IE and stuck valve by thrombus because we have experience of redo surgery with excellent results.

Nowadays, surgical intervention for IE is associated with 90% hospital survival, and have better outcomes for native valve IE than for PVE. Finally, Staph. Aureus was more

aggressive and had higher mortality compared with other pathogens causing IE (1).

Surgery for acute IE has provided excellent results, as regard to be free from reinfection and redo. A strategy of extensive debridement, reconstruction of destroyed infective structures with bovine pericardial patch, then valve replacement or repair is very effective and shows excellent outcomes (7).

### Conclusion

Prosthetic valve endocarditis (PVE) surgery has high morbidity and mortality risk; however, it is safe with excellent outcomes in high experienced centers especially in case of rare organisms and two valves in mitral position.

### Abbreviations

**SVC:** superior vena cava, **IVC:** inferior vena cava, **CPB:** cardiopulmonary bypass, **IV:** intravenous, **IE:** infective endocarditis, **MVR:** mitral valve replacement, **PVE:** prosthetic valve endocarditis, **CT:** computed tomography, **PICC:** peripherally inserted central catheter, **ECG:** electrocardiography, **BP:** blood pressure, **TTE:** transthoracic echo. **TEE** Transesophageal echo, **ACT:** active clotting time, **PO:** per oral, **OD:** once daily, **VSD:** ventricular septal defect, **ASD:** atrial septal defect, **PDA:** patent ductus arteriosus, **SLE:** systemic lupus erythromatosus



**Figure 3.** PVE with extraction of bioprosthetic and SAPIEN valves.

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