

## Valve in Valve mitral as a management option in bioprosthetic valve dysfunction

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### *Abstract*

**Introduction:** Mitral valve disease is one of the most frequent valvulopathies, within the indications for management one of the options is valve replacement, however, these patients over time can develop bioprosthetic valve dysfunction, being patients considered at high surgical risk due to the previous intervention.

**Methodology:** A bibliographic search was carried out through pubmed using the following terms: (bioprosthetic valve dysfunction) published articles were analyzed.

**Results:** Articles were identified by searching pubmed for articles on Valve in Valve mitral.

**Conclusion:** The transcatheter mitral valve is an option for high-risk patients with previous biological valve dysfunction with a high success rate and low risk of complications.

**Keywords:** Bioprosthesis, Mitral valve, Dysfunction.

### **Introduction:**

Mitral valve disease is one of the most frequent valvulopathies, within the indications for management one of the options is valve repair or change.(1,2). In those patients whose repair success is not guaranteed, valve replacement is indicated; however, over time these patients may develop bioprosthetic valve dysfunction, and patients are considered to be at high perioperative risk due to a history of cardiac surgery. For these patients, transcatheter implantation of a

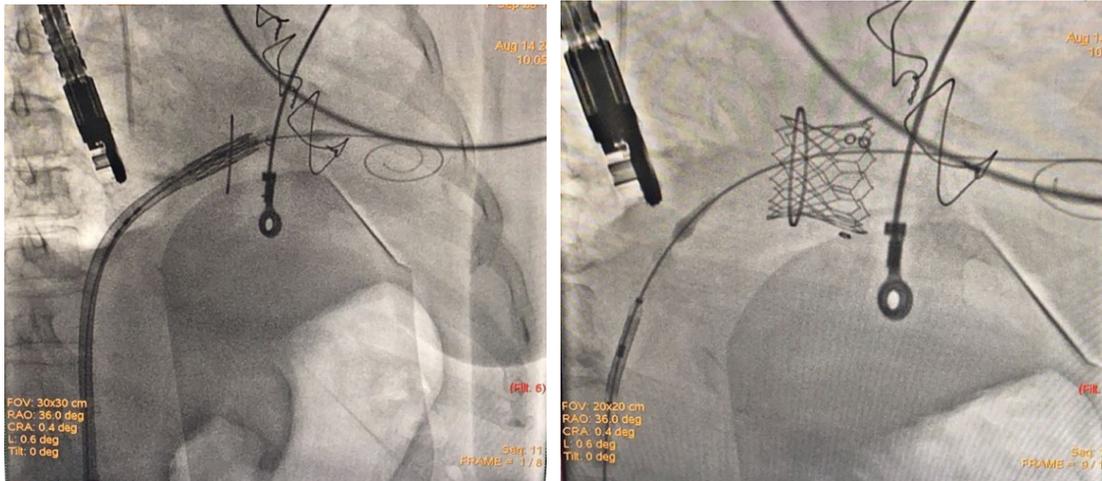
valve in mitral position emerges as a safe management option without the risks associated with reoperation(3). Four cases of patients with mitral bioprosthetic dysfunction are described below, in whom mitral viv (Valve in Valve) was indicated as definitive management.

### **Case description**

**Case 1:** A 74-year-old woman with a history of mitral regurgitation who underwent placement of a bio-

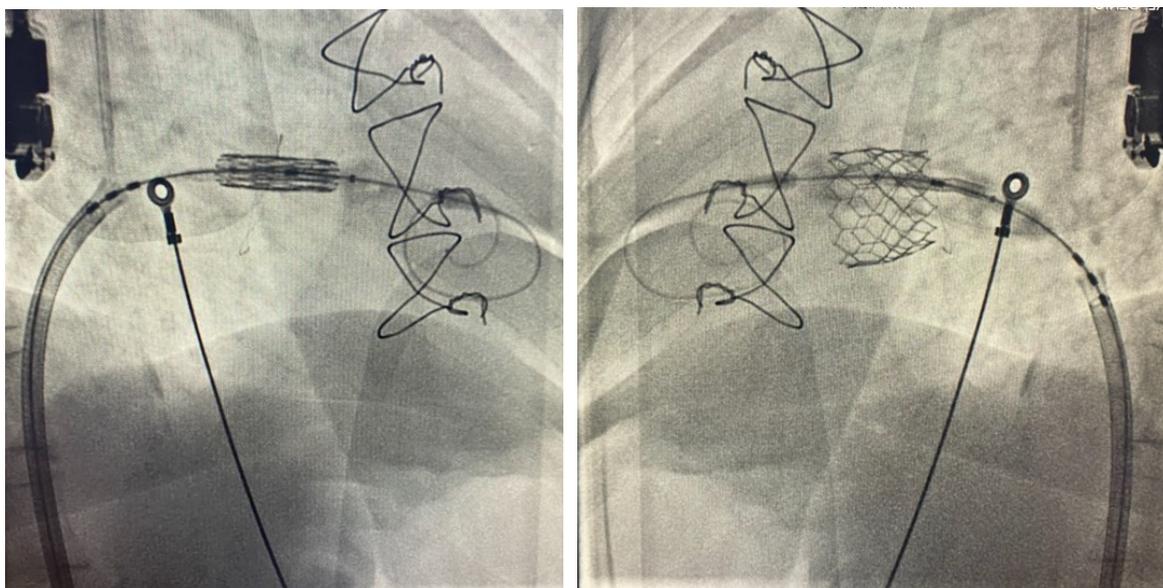
logical mitral valve, evolving 5 years later with bioprosthetic valve dysfunction. Given the surgical history, she was evaluated by the cardiology board considering performing a mitral viv EDWARDS percutaneous valve is advanced S3 N.26 and is positioned under echocardiographic vision in the mitral position, it is implanted without complications, later a

transesophageal echocardiogram is performed corroborating excellent position and implant without residual leaks, with a mean gradient of 6mmhg after valve insertion. Going a month after the procedure, he reported notable improvement in his functional class.



**Case 2:** An 83-year-old woman diagnosed with mitral valve regurgitation of severe symptomatic rheumatic etiology, for which she required valve replacement with a ST JUDE 27MM biological mitral valve prosthesis. 6 years later, the functional class deteriorated. A transthoracic echocardiogram was performed, which evidenced biological valve dysfunction. It was evaluated by a cardiology board considering the high risk and advanced age. EDWARDS

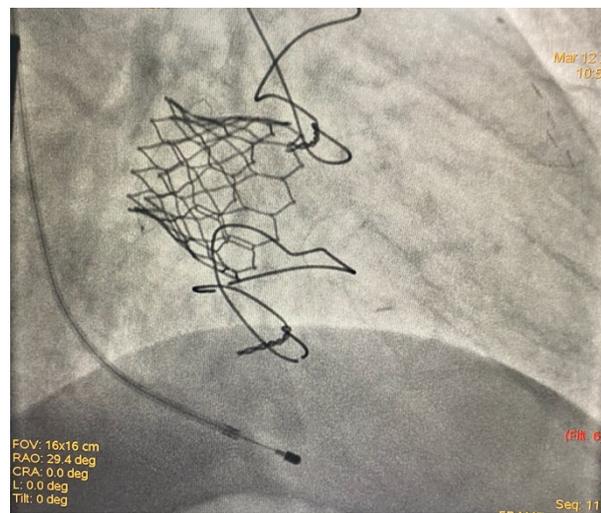
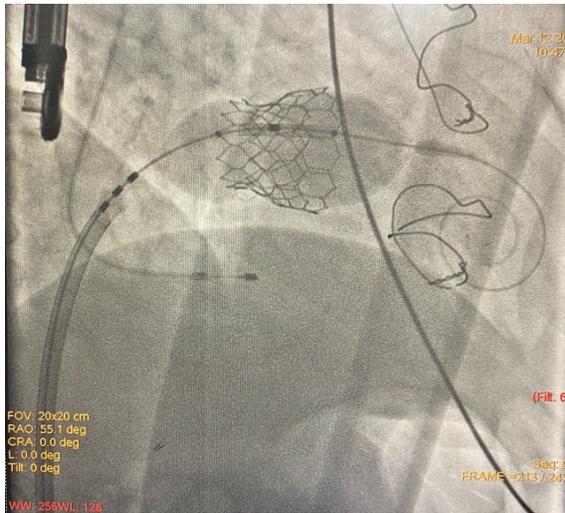
S3 N. 26 mitral viv implantation was considered via the femoral route and with General anesthesia proceeded to implant the valve, subsequently assessing adequate implantation with a transesophageal echocardiogram, without leaks or evidence of prosthesis-patient mismatch with a mean gradient of 7mmhg after valve insertion. He attended a month after the procedure, reporting improvement in his functional class.



### Case 3:

A 66-year-old man with a history of biological mitral valve replacement due to double mitral valve lesion due to severe mitral stenosis and moderate mitral regurgitation required biological mitral valve replacement, evolving 4 years later with deterioration of functional class, transthoracic echocardiogram was performed with biological valve dysfunction therefore which is evaluated by the board of cardiology given the history of cardiac surgery and

the surgical risk is indicated mitral viv, under general anesthesia we proceed via the femoral route to place a valve implant in mitral position EDWARDS S3 N.29 without complications, adequate implantation transesophageal echocardiogram is evaluated without leak stopper or evidence of prosthesis-patient mismatch with a mean gradient of 7mmhg after valve insertion. Going a month after the procedure referring improvement in his functional class.



### Discussion:

Surgical management of primary mitral regurgitation is based on two strategies: the first option is valve repair and the second is valve replacement indicated for those patients where repair is not feasible. Currently, mitral valve repair is preferred over replacement, as it has been shown to be a procedure with a better prognosis and also postpones the need for replacement in relatively younger patients(4). These patients must have an adequate echocardiographic assessment prior to intervention to define the best strategy, preferring repair in those patients whose aetiology is degenerative Carpentier II with A2 and/or P2 prolapse without calcification with mild to moderate dilation of the mitral annulus and those with secondary Carpentier mitral regurgitation. I or IIIB without calcification and with dilation to moderate; on the other hand, surgical change is preferred in cases of endocarditis, in cases of Barlow's disease and rheumatic disease when annular dilatation is severe and extensive calcification(5).

In those patients in whom valve replacement is in-

dicated, there are two options: one is the implantation of a mechanical valve, which is preferred in young patients given the longevity of the valve, and the other is the biological valve replacement, which does not require lifelong anticoagulation, but it has the disadvantage of a lower longevity, these patients over time can develop bioprosthetic dysfunction as in the previously mentioned cases (1,2). Bioprosthetic valve dysfunction can be caused by various mechanisms of structural valve impairment including structural impairment caused by permanent intrinsic change of the tissue component of the valve (ie, leaflet tear, calcification, rupture, etc.) Leading to degeneration and/or dysfunction which, in turn, can lead to intra-prosthetic stenosis or regurgitation, another mechanism is non-structural valve impairment which includes any abnormality not intrinsic to the prosthetic valve itself leading to degeneration and/or dysfunction', such as leakage paravalvular, malposition of the prosthesis, patient-prosthesis mismatch (PPM) and late embolization, there are two other mechanisms that are valve thrombosis and endocarditis(6,7). In the previously described cases, they were patients

with structural valvular deterioration, which is why it was decided to intervene.

In the scenario of bioprosthetic valve dysfunction, there are two management options: valve re-intervention and the other option is transcatheter valve implantation on the mitral valve.(6). Viv mitral compared to re-intervention is a less invasive option and could be considered in those patients with prohibitive surgical risk, viv mitral is associated with lower mortality, periprocedural morbidity compared to mitral valve replacement(8). Therefore, we could consider this procedure as a viable option for patients with biological prosthetic valve dysfunction; however, studies are needed to demonstrate its efficacy and safety over time. In a retrospective cohort study that included a total of 1529 patients, technical success of the procedure was demonstrated in 1480 patients (96.8%), also demonstrating low mortality at 30 days and one year with significant improvement in the symptoms of insufficiency. Heart rate and sustained valve performance(3).

### Conclusion:

Surgical interventions for valve replacement imply a significant perioperative risk, therefore transcatheter valve implantation is used every day in order to reduce these risks. Currently, transcatheter mitral valve implantation by transseptal puncture is an option for patients with biological valve dysfunction with a high success rate and low risk of complications, which makes mitral viv a considerable option.

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