

Case Report

Transcatheter Aortic Valve Implantation for Severe Aortic Regurgitation

Mohammed Balghith^{1,2}, Ahmed Arifi^{1,2}, Mohammed Alabdulsalam^{1,2*}, Ghassan Alhajress^{1,2}, Abdullah Alsaghyir^{1,2}

¹ College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia.

² King Abdullah International Medical Research Center, Riyadh, Saudi Arabia.

***Corresponding author:** Mohammed Alabdulsalam, College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia. Tel: 966505444056

Received: 07 May 2021; **Accepted:** 14 May 2021; **Published:** 20 May 2021

Citation: Mohammed Balghith, Abdullah Alsaghyir, Mohammed Alabdulsalam, Ghassan Alhajress. Transcatheter Aortic Valve Implantation for Severe Aortic Regurgitation. Cardiology and Cardiovascular Medicine 5 (2021): 315-320.

1. Introduction

A trans aortic valve implantation (TAVI) is a well-known procedure for the treatment of severe symptomatic aortic stenosis (AS), if the patient is not a candidate for a surgical intervention [1]. It is the standard of care for moderate to severe AS in high-risk patients. Historically, the first case was done in France 2002 [2]. Since then, many cases have been done globally, as well as in Saudi Arabia at the King Abdulaziz Cardiac Center, King Abdulaziz Medical City in Riyadh. In addition, with the evolution in medicine, TAVI has increasingly been used for the

treatment of selected severe cases of aortic regurgitation [3].

2. Case Report

We are presenting an interesting case of a morbidly obese woman of 78 years, with aortic valve regurgitation, associated with a large vegetation due to infective endocarditis. She is a known case of diabetes mellitus, hypertension, dyslipidemia and urinary tract infection (UTI), with limited mobility. She was treated conservatively for the endocarditis

with antibiotics for six weeks. The case was discussed in a combined cardiology/cardiac surgery meeting, and she was initially accepted for an aortic valve replacement after completing the antibiotic course. However, the patient was admitted due to UTI. A day after, the patient developed acute heart failure. The patient was stabilized, and her general condition was slightly improved. A few weeks later, she went into cardiac arrest and successfully resuscitated. Due to these events, in addition to the patient's comorbidities and increased risk of perioperative mortality, she was rejected for a surgical intervention. Her echo showed severe aortic regurgitation with mild aortic calcification. The aortic valve was not visualized well but small vegetation was seen. The cardiology team decided to proceed with TAVI for the aortic regurgitation. The patient underwent a diagnostic Cath before the procedure. She was transferred to the Catheter laboratory. The risks and benefits were discussed at length with the patient. The patient agreed to proceed with the TAVI procedure for her aortic regurgitation. She was taken to the Catheter laboratory, and after intravenous cannulation, she was prepped in a supine position. A Heparin bolus was administered. The right radial artery was accessed, and a sheath was inserted over a guidewire. The patient was intubated by the anesthesiologists, who initiated ventilation. The

procedure proceeded with general anesthesia. A lumen catheter was inserted in the right jugular vein. The left femoral vein was accessed, and a sheath was inserted over a guidewire. A cut-down technique was done in the right groin area. A temporary pacemaker (TPM) was inserted through the left femoral vein and placed in the right ventricle for standby pacing. The right femoral artery was accessed, and a sheath inserted over a guidewire. A pigtail catheter was advanced under fluoroscopy over a guidewire and a selective angiography of the aorta was done using an injection machine. TEE was initiated to obtain the right size of the aortic valve. A catheter was used to cross with a wire through the right femoral artery, to the left ventricle. The right femoral access was used to deploy the core valve. We used a 26mm Evolut R core valve, using fast ventricle pacing. A left femoral artery angiogram was done. The patient tolerated the procedure well. There were no complications postoperatively aside from mild blood oozing from the incisional site. The next day a two-dimensional transthoracic echocardiogram was done, which indicated no aortic regurgitation. The patient was discharged on day 5 following the procedure with Plavix and aspirin for 3 months. This case demonstrates the suitability of TAVI as an alternative to SAVR for AR in morbid high-risk patients.

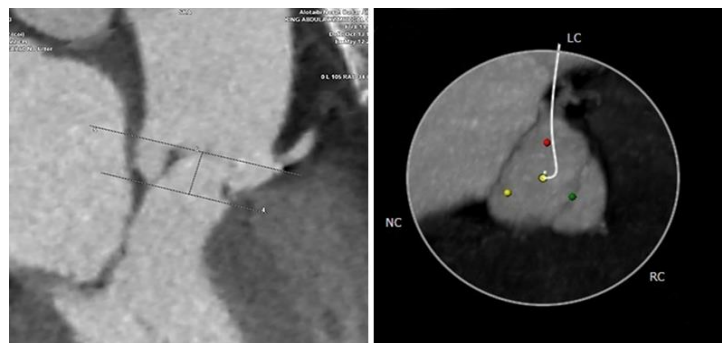


Figure 1: Cardiac CT scan showed no obvious aortic valve calcification.



Figure 2: Coronary angiography of left coronary artery and right coronary artery both showed no obstructive lesions.



Figure 3: Baseline aortogram showed a severe aortic regurgitation.

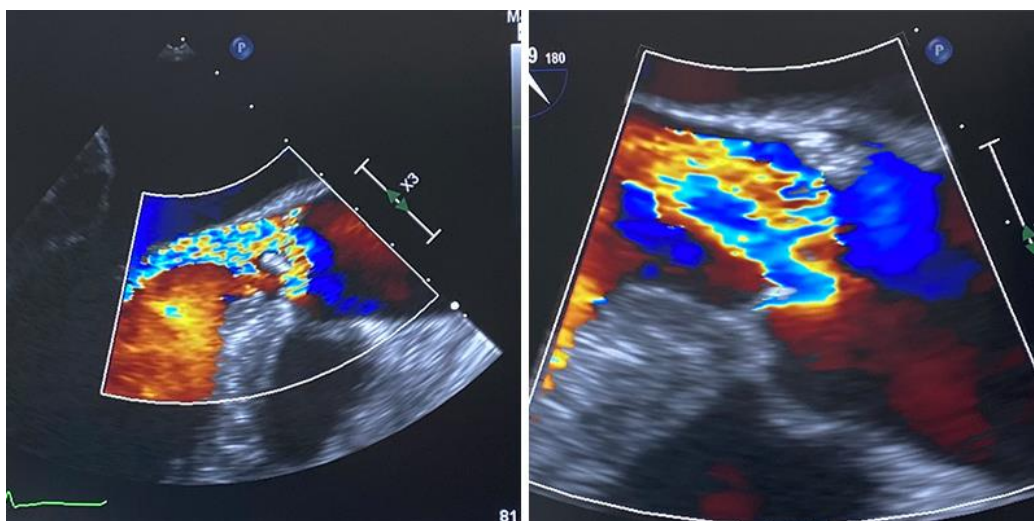


Figure 4: Echocardiogram before the procedure showing severe aortic regurgitation.

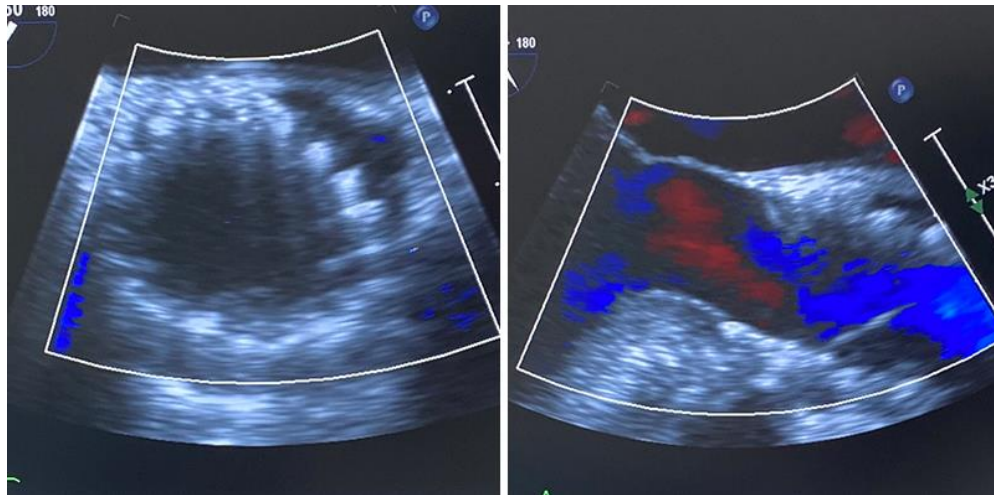


Figure 5: Echo was used during the deployment and with color Doppler, in both short and long access views. There was no paravalvular leak (PVL).

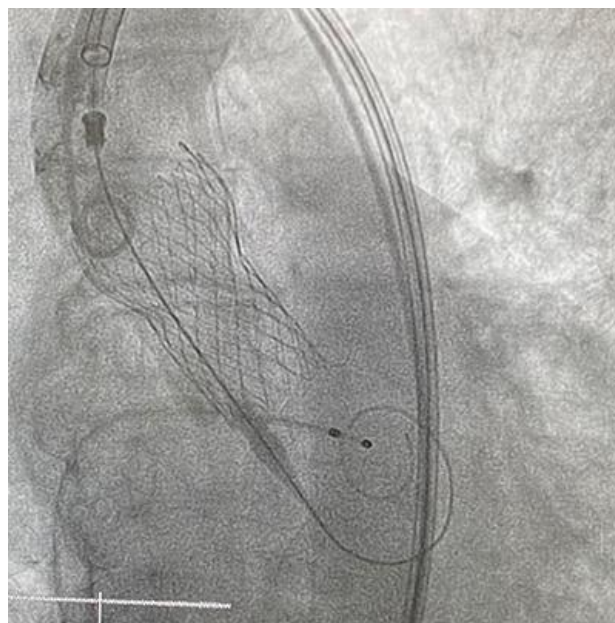


Figure 6: Aortogram post TAVI showed no aortic regurgitation

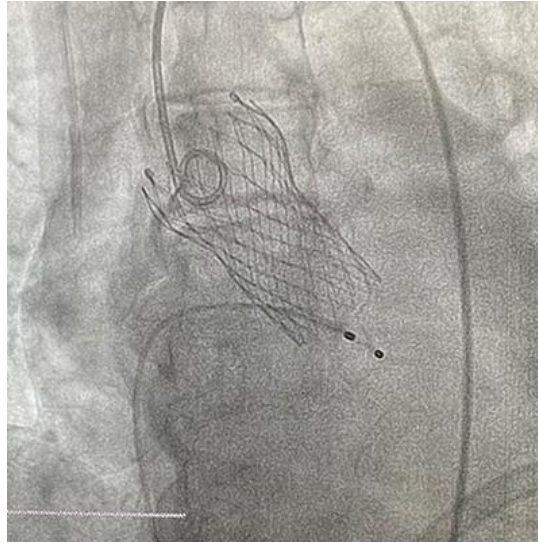


Figure 7: Final fluoroscopy showed the final deployment of the Evolut R core valve

4. Discussion

TAVI have been the standard of care for patients with symptomatic severe AS, who are considered at high risk for a surgical aortic valve replacement. This indication has now been extended to intermediate and low surgical risk patients with severe AS (19,20). In patients with mixed pathology of aortic valve disease with severe AS and at least moderate aortic regurgitation, treatment with TAVI have been successful with both balloon-expandable and self-expanding TAVI [4]. However, severe NAVR without aortic stenosis is still considered a contraindication for TAVI [5]. We were aware that this therapy has been used anecdotally in small numbers of patients in individual centers [6].

The current patient was primarily diagnosed with aortic regurgitation, with very mild calcification at the aortic leaflets. The patient was elderly with a high surgical risk and treated as an off-label case, using a self-expandable valve (Evolut R Core Valve). The results were excellent.

There are multiple reasons to explain why the TAVI has not been the treatment of choice in the patients with NAVR. We know that population surveys indicate that AS occurs more frequently, compared with aortic regurgitation (33.9% vs. 10.4% in patients with aortic valvular heart disease), and patients are 4 times more likely to have surgical AVR for aortic stenosis than aortic regurgitation [7]. The etiology of AR is different, and it can affect younger patients and involve the ascending aorta. Surgery could be the standard treatment with pure NAVR [8]. In addition, due to the anatomical complexity, patients with AR will make TAVI more challenging.

Funding

This case report did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

All authors have no conflicts of interest to declare.

References

1. F H, M A, WK K, T W. Transcatheter aortic valve implantation (TAVI) in 2018: recent advances and future development [Internet]. PubMed. 8: (2021).
2. Cribier A. First FIM Percutaneously Implanted Heart Valve (PHV) implantation on 16 April, 2002 [Internet]. PCR Online. 2017 [cited 8 March 2021].
3. A.B Gopalamurugan et al. TAVI for aortic regurgitation – India’s first case Corevalve Evolut R. [Internet]. India Heart Journal. 2016 [cited 8 March 2021].
4. Grube E, Laborde JC, Gerckens U, et al. Percutaneous implantation of the CoreValve self-expanding valve prosthesis in high-risk patients with aortic valve disease: the Siegburg first-in-man study. *Circulation* 114 (2006): 1616–1624.
5. Holmes DR Jr., Mack MJ, Kaul S, et al. 2012 ACCF/AATS/SCAI/ STS expert consensus document on transcatheter aortic valve replacement. *J Am Coll Cardiol* 59 (2012): 1200–1254.
6. Dhillon P, Kakouros N, Brecker S. Transcatheter aortic valve replacement for symptomatic severe aortic valve regurgitation. *Heart* 96 (2010): 810.
7. Krumdorf U, Haass M, Pirot M, Chorianopoulos E, Katus H, Bekerredjian R. Technical challenge of transfemoral aortic valve implantation in a patient with severe aortic regurgitation. *Circ Cardiovasc Interv* 4 (2011): 210–211.
8. Ducrocq G, Himbert D, Hvass U, Vahanian A. Compassionate aortic valve implantation for severe aortic regurgitation. *J Thorac Cardiovasc Surg* 140 (2010): 930–932.



This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC-BY\) license 4.0](https://creativecommons.org/licenses/by/4.0/)