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Dynamic Left Ventricular Obstruction Post Transcatheter Aortic Valve Replacement (TAVR): The “Suicide LV” Phenomenon

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Dynamic Left Ventricular Obstruction Post-Transcatheter Aortic Valve Replacement (TAVR): The “Suicide LV” Phenomenon

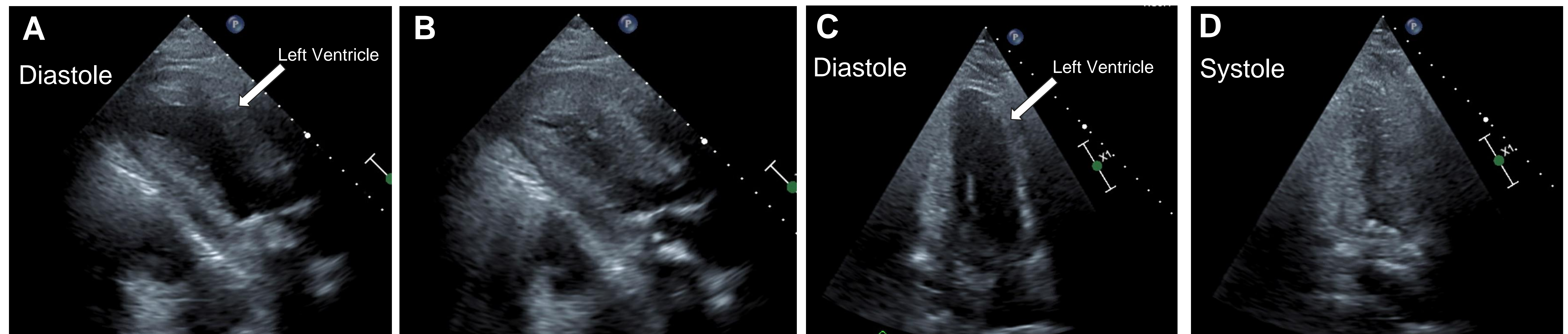
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Introduction

- The transcatheter aortic valve replacement (TAVR) has become a relatively common treatment option for aortic stenosis, especially given the growing number of older patients with severe degenerative aortic stenosis
- While the procedure is overall very safe, there are still a number of potentially serious complications including bleeding, stroke, and cardiac tamponade. One rare complication is a dynamic left ventricular obstruction post-valve deployment, which has been called the “Suicide LV” phenomenon.
- Rapid hemodynamic compromise resulting from this can result in significant morbidity and mortality if not diagnosed in time.
- Given the increasing frequency of patients undergoing this procedure, it is important to highlight this underrecognized problem

Figure 1
Post-TAVR 2D Echo Images



From left to right: **A** - parasternal long axis view in diastole, **B** - parasternal long axis view in systole, **C** – apical 2 chamber view in diastole, **D** – apical 2 chamber view in systole

Case Presentation

- Patient was a 85 year old male with a history of CAD, ischemic stroke, symptomatic degenerative native aortic valve stenosis, presenting for elective TAVR
- A recent transthoracic echocardiogram showed normal LV and RV function
- Pre-operative labs, vitals, EKG, and physical exam were unremarkable.
- Patient underwent TAVR via right femoral artery approach. A 26mm Edwards Sapiens 3 valve was then deployed without issues.
- Intra-operative echocardiogram showed normal TAVR position without any pericardial effusion or paravalvular leak.
- Initial post-procedure course was unremarkable, patient AAOx3 with stable vitals
- Patient became acutely hypotensive and lethargic after about 45 minutes in the recovery area.
- Patient was initially responsive to IVF, but subsequently decompensated into shock.

Case Presentation (cont.)

- An urgent echocardiogram showed hyperdynamic LV function noted with no paravalvular leak or tamponade. The EKG did not show any heart block
- An urgent chest X-ray, CT scan and angiogram were negative for bleeding or pneumothorax
- Patient eventually required intubation in the ICU and addition of multiple vasopressors.
- Select images from the post-TAVR echocardiogram are shown in Figure 1. These images demonstrate almost complete left ventricular cavity collapse during systole, suggesting an intracavitary obstruction as the cause of the patient’s decompensation
- This phenomenon has been only described in a limited capacity as case reports. A PubMed search was performed using the keywords “suicide LV, TAVR, and obstruction”, which resulted in 6 case reports.

Literature Review and Discussion

- Patients at highest risk for this include those with normal to hyperdynamic LV function with LV wall hypertrophy.
- Sudden afterload reduction from the removal of the stenotic valve exposes an underlying hypercontractile left ventricle, resulting in excessive unloading of the LV chamber which then develops into a dynamic intracavitary/LV outflow tract obstruction.
- The physiologic compensatory tachycardia paradoxically worsens the obstruction and subsequent hypotension - mimicking a hypertrophic obstructive cardiomyopathy. This is the reason why it is called the “Suicide LV” phenomenon
- Management in suspected cases should begin with aggressive volume resuscitation and peripherally acting vasopressor agents.

References

- Khawaja, M. Z., et al. (2013). "Successful rescue of a "suicide ventricle" during transfemoral transcatheter aortic valve implantation (TF-TAVI)." *European Heart Journal* 34(suppl_1).
- Marchel, M., et al. (2020). "Left ventricular outflow obstruction after TAVR due to systolic anterior motion successfully treated With cardiac pacing." *J Cardiothorac Vasc Anesth* 34(10): 2718-2721.
- Shaikh, U., et al. (2019). "Suicide Ventricle After Treatment of Post-Transcatheter Aortic Valve Replacement." *Critical Care Medicine* 47(1): 73.
- Suh, W. M., et al. (2010). "Suicide left ventricle following transcatheter aortic valve implantation." *Catheter Cardiovasc Interv* 76(4): 616-620.
- Alfonso, F., et al. (2015). "Severe intraventricular dynamic gradient following transcatheter aortic valve implantation: suicide ventricle?" *EuroIntervention* 11(1): e1.
- Leya, F., et al. (2016). "Abnormal distortion of aortic core valve bioprosthesis with suicide left ventricle, aortic insufficiency, and severe mitral regurgitation during transcatheter aortic valve replacement." *Catheter Cardiovasc Interv* 88(7): 1181-1187.