

Aortic Puncture During Transcatheter Mitral Valve in Valve Replacement

Hrithika Ravuri, BS¹, Shabaaz M. Baig, MD¹, Rajendra Raval, MD²

¹Department of Anesthesia and Perioperative Care, Rutgers New Jersey Medical School, Newark, NJ, USA

²Department of Anesthesia and Perioperative Care, Newark Beth Israel Medical Center, Newark NJ, USA

Introduction

- Mitral Valve Dysplasia Syndrome (MVDS) is a rare fetal congenital disorder characterized by a collection of multiple cardiac malformations [1,2].
- Typically presents with mitral valve dysplasia, a hypoplastic orifice, and short, thickened chordae tendineae [1,2].
- Can be accompanied by multiple cardiac anomalies, such as a hypoplastic aorta and stenotic aortic valves [1-3].
- Patients also often undergo multiple cardiac surgeries, leading to the formation of scar tissue around the heart.
- Most patients are diagnosed early in life and undergo successful mitral valve replacement
- Some patients will require a new valve later in life, which can be accomplished with a fluoroscopy-guided “valve-in-valve” technique, thus not needing another sternotomy.

Imaging

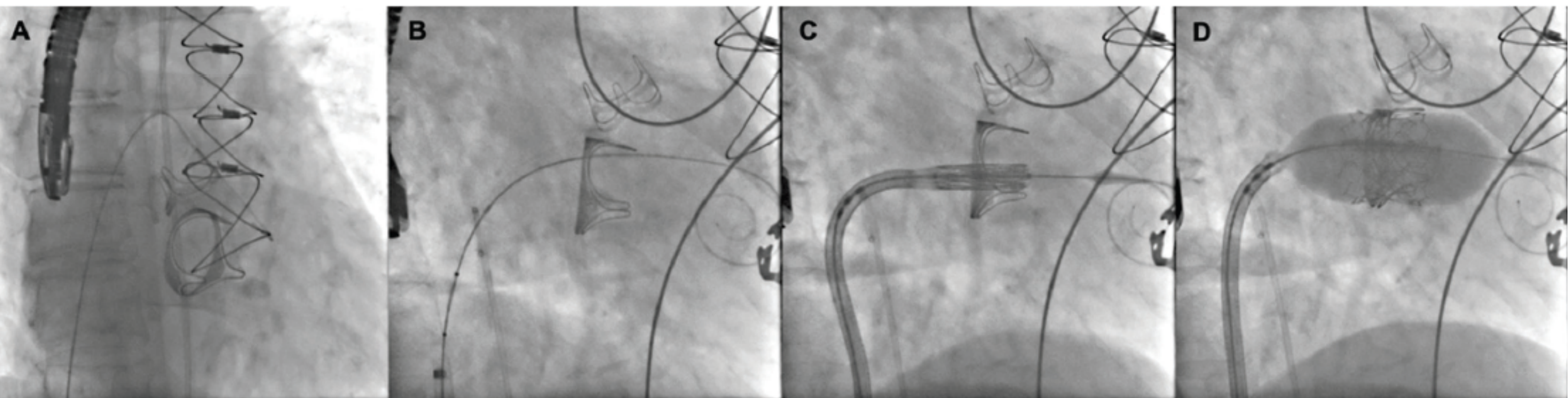


Figure 1: Example of Valve-in-Valve Transcatheter Mitral Valve Replacement

A: Intra-operative fluoroscopy with visualization of prior mitral bioprothetic valve. B: Stiff wire advanced across previously placed valve. C: Percutaneous valve (SAPIEN III) advanced across valve and positioned. D: Valve deployment across mitral prosthesis.

Case Description

- Patient was a 19-year-old female with a history of mitral valve dysplasia and multiple prior congenital cardiac surgeries including a prior mitral valve replacement.
- She presented for a transcatheter mitral valve replacement (TMVR) using the valve-in-valve (ViV) technique to replace a stenotic mitral valve.
- She was placed under general anesthesia without complications. An arterial line and two 18-gauge intravenous lines were placed.
- While attempting trans-septal puncture, an 8 French dilator punctured the right atrium and ascending aorta.
- An emergent sternotomy was performed, and the patient was emergently placed on cardiopulmonary bypass and deep hypothermic circulatory arrest (DHCA). Blood product transfusion was quickly initiated, and central venous access was obtained rapidly.
- The patient required three separate episodes of deep hypothermic circulatory arrest to fix the aortic injury, totaling 90 minutes of circulatory arrest time.
- The patient was taken to the intensive care unit and was extubated several days later after demonstrating intact neurological function.

Conclusion

- Our case highlights an unexpected complication from procedures using the ViV technique.
- Our patient was a good candidate for the ViV technique; however, anesthesiologists should note that although this is not open heart surgery, it can be a very high-risk procedure due to the possibility of significant scar tissue from previous cardiac surgeries.
- Clinicians should be aware of this possible complication and be particularly prepared to act quickly with obtaining access (ideally obtaining it prior), transfusing blood products, and managing hemodynamics if the need to convert to a sternotomy and go on bypass is necessary.

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References

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