Emergency Transcatheter Aortic Valve Replacement in Cardiogenic Shock due to Acutely Failed Aortic Bioprosthetic Valve

Marvin Kajy MD
William Merhi DO
Spectrum Health /Michigan State University
marvin.kajy@spectrumhealth.org
Disclosures

- No relevant financial relationships
Introduction/Objective:

- Bioprosthetic valves are expected to deteriorate and eventually fail. Reoperation has been the standard treatment for degenerated prosthetic valves. However, reoperation may carry significant risks.
Introduction/Objective:

- Bioprosthetic valves are expected to deteriorate and eventually fail. Reoperation has been the standard treatment for degenerated prosthetic valves. However, reoperation may carry significant risks.

- Valve-in-valve transcatheter aortic valve replacement (ViV TAVR) is gaining acceptance as an alternative to surgical valve replacement for select patients with failed bioprosthesis aortic valves. Indicated for patients who are considered high or prohibitive risk for redo AVR.
Introduction/Objective:

• Bioprosthetic valves are expected to deteriorate and eventually fail. Reoperation has been the standard treatment for degenerated prosthetic valves. However, reoperation may carry significant risks.

• Valve-in-valve transcatheter aortic valve replacement (ViV TAVR) is gaining acceptance as an alternative to surgical valve replacement for select patients with failed bioprosthetic aortic valves. Indicated for patients who are considered high or prohibitive risk for redo AVR.

• Its use in patients with cardiogenic shock is limited.
Introduction/Objective:

- Bioprosthetic valves are expected to deteriorate and eventually fail. Reoperation has been the standard treatment for degenerated prosthetic valves. However, reoperation may carry significant risks.

- Valve-in-valve transcatheter aortic valve replacement (ViV TAVR) is gaining acceptance as an alternative to surgical valve replacement for select patients with failed bioprosthetic aortic valves. Indicated for patients who are considered high or prohibitive risk for redo AVR.

- Its use in patients with cardiogenic shock is limited.

- We describe a patient with cardiogenic shock secondary to a degenerated bioprosthetic aortic valve and successfully underwent an emergent ViV TAVR via a transaxillary approach.
Case Description:

- An 87-year-old man with a past medical history of bioprosthetic aortic valve replacement with a 27 mm Trifecta valve (St. Jude Medical, Inc., St. Paul, MN) and 4V CABG 8 years ago.
- CC: SOB and malaise that started suddenly 2 days prior to admission.
- PMHx: HTN, CKD3, PAD with aortoiliac stent graft with a stenting in the left common iliac artery.
Case Description:

- **Vital signs**
  - BP 154/39, HR 110 BPM, RR 21, T 36.7°C, SpO2 89%

- **Physical examination:**
  - General: The patient was in moderate distress.
  - Lung: Crackles present bilaterally.
  - Cardiac: Grade IV/VI diastolic murmur, bounding pulses present bilaterally. JVP up to 12 cm. Positive for bilateral lower extremity edema.
Case Description:

- **Vital signs**
  - BP 154/39, HR 110 BPM, RR 21, T 36.7°C, SpO2 89%

- **Physical examination:**
  - General: The patient was in moderate distress.
  - Lung: Crackles present bilaterally.
  - Cardiac: Grade IV/VI diastolic murmur, bounding pulses present bilaterally. JVP up to 12 cm. Positive for bilateral lower extremity edema.

- Admitted for acute hypoxic respiratory failure secondary to decompensated heart failure.
TTE

PLAX

A3C
TEE

mid esophageal 120°

mid esophageal 37°
Case Description:

RHC
RA: 15
PA: 63/28 mean 35
PCWP: mean 30, V waves 38
Fick CO: 2.48. Fick CI 1.24
Hospital Course

Admitted to CCU for inotropic support and lasix gtt

Evaluated by CT surgery and structural heart teams

- Coronary angiogram: all bypass grafts were patent
- STS score: 18.7%
- Severe PAD: TAVR access site problematic
Hospital Course
Plan by Heart Team

- Transaxillary access TAVR
Procedure: TVP Access
Procedure: TAVR Access Site
Procedure
Procedure

Pre-implant LVEDP: 23 mmHg, dBP mid 20s
Procedure: Valve Deployment
Hemodynamics peri Corevalve Deployment

Pre-deployment

Post-deployment
Procedure: Valve Successfully Deployed
Post Operative Course

- No neurovascular complications
- The patient was weaned off inotropic support on POD #1
- Discharged POD #3
Discussion: Emergent ViV TAVR

- TAVR has become an established therapy in stable patients with native aortic valve regurgitation or failed bioprosthetic valves.
Discussion: Emergent ViV TAVR

- TAVR has become an established therapy in stable patients with native aortic valve regurgitation or failed bioprosthetic valves.

- Our case demonstrates that TAVR is effective and feasible in patients with degenerative bioprosthetic valve failure who present with cardiogenic shock due to acute aortic regurgitation and with no other therapeutic options.
Discussion: Emergent ViV TAVR

- TAVR has become an established therapy in stable patients with native aortic valve regurgitation or failed bioprosthetic valves.
- Our case demonstrates that TAVR is effective and feasible in patients with degenerative bioprosthetic valve failure who present with cardiogenic shock due to acute aortic regurgitation and with no other therapeutic options.
- Percutaneous axillary approach for TAVR is a viable option at experienced centers.
Discussion: Emergent ViV TAVR

- TAVR has become an established therapy in stable patients with native aortic valve regurgitation or failed bioprosthetic valves.
- Our case demonstrates that TAVR is effective and feasible in patients with degenerative bioprosthetic valve failure who present with cardiogenic shock due to acute aortic regurgitation and with no other therapeutic options.
- Percutaneous axillary approach for TAVR is a viable option at experienced centers.
- Due to the acuity of the situation and need for a thoughtful urgent decision, a multidisciplinary team approach is critical for such patients.
Conclusion: Emergent ViV TAVR

- Emergent ViV TAVR is an option for the management of patients with bioprosthetic valve failure at extreme surgical risk complicated by cardiogenic shock.
Conclusion: Emergent ViV TAVR

- Emergent ViV TAVR is an option for the management of patients with bioprosthetic valve failure at extreme surgical risk complicated by cardiogenic shock.

- In such cases, the heart team should be prepared to proceed to emergent implantation for timely and successful management of the patient.