Late Onset of Complete Heart Block following Transcatheter Aortic Valve Replacement: A Case Report

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Objective

The objective is to discuss a rare variant of a Transcatheter Aortic Valve Replacement (TAVR) complication and highlight its presentation, risk factors, evolving management, and clinical significance.

Background

- Aortic stenosis is one of the most common valvular abnormalities in the US[1].
- TAVR has become a popular alternative treatment for severe aortic stenosis in patients at intermediate to high surgical risk[1].
- One of the frequent complications of TAVR are atrioventricular conduction abnormalities (AVCA), most commonly new onset Left Bundle Branch Block (LBBB) and various degrees of AV nodal blocks[2].
- Although AVCA usually occurs in the acute post operative setting, delayed presentations one year after TAVR have been described, but are rare[3].

Case Description

- A 69-year-old male with a history of HTN, CAD, HLD, and severe aortic stenosis, one year s/p TAVR, presented to the ER for progressively worsening lightheadedness, dizziness, and presyncope.
- He was seen the day prior in Cardiology clinic for his symptoms and placed on a 7-day cardiac monitor, which recorded 2 prolonged, symptomatic, sinus pauses, prompting evaluation in the ED.
- Vitals were significant for intermittent bradycardia and hypertension. Symmetric pulses and clear lungs on physical exam. ECG revealed a sinus rhythm with LBBB, unchanged from prior. Serum electrolytes unremarkable.
- Patient was evaluated by Cardiology and diagnosed with complete heart block (CHB) as a complication from TAVR based on his symptomatology and overnight cardiac monitor findings, ruling out medication toxicity and infection as alternate etiologies. Ischemia was less likely given no acute ST segment changes on ECG. Troponins were not obtained. Most recent echocardiogram showed no wall motion abnormalities.
- Patient was admitted for permanent pacemaker implantation (PPM) and 24-hour telemetry monitoring and discharged in stable condition the following day.

References:

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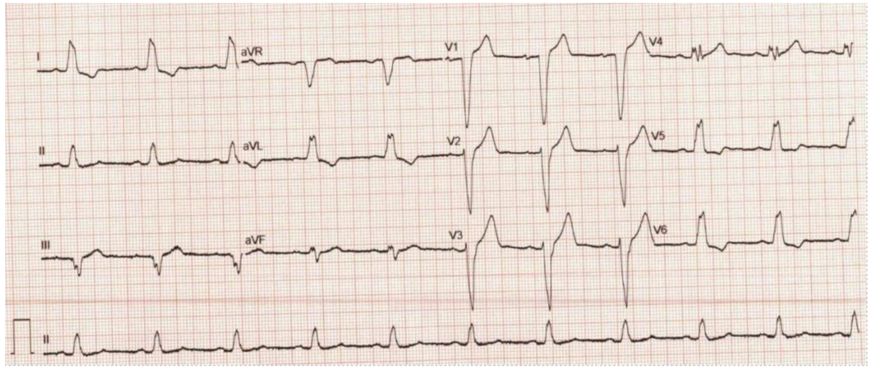

Figure 1 - Patient's electrocardiogram obtained in outpatient cardiology clinic one day prior to episode. Left bundle branch block unchanged from prior ECG one month post TAVR

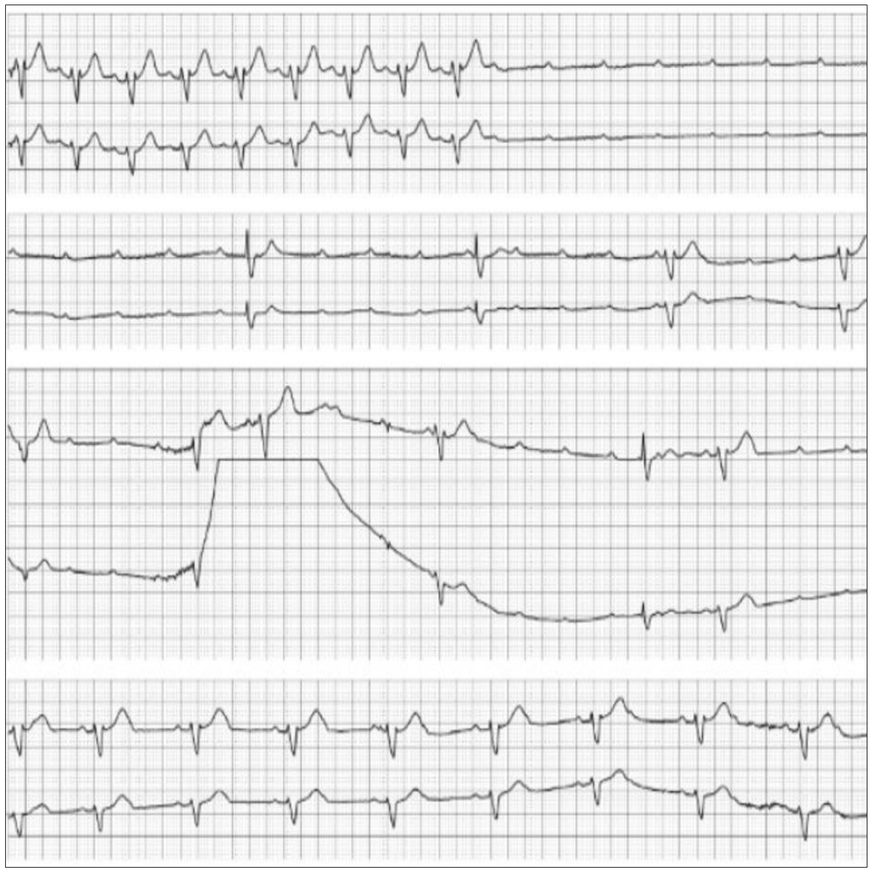

Figure 2- Cardiac monitor rhythm strip displays a prolonged sinus pause. Likely a 3rd degree/complete heart block as shown by P wave dissociation from each QRS response.

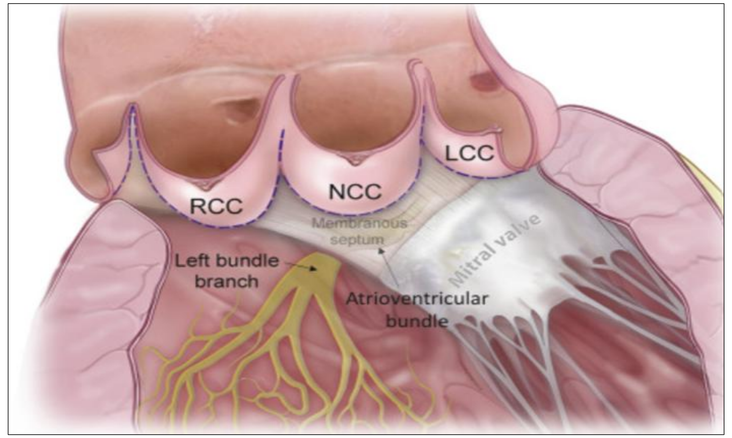

Figure 3. Cardiac conduction anatomy and aortic valve cusps[10]

Discussion

- AVCA is one of the five major complications of TAVR and impacts quality of life and mortality[4,5]
- The mechanism is mechanical stress, inflammation, and ischemia disrupting the heart's electrical conductivity[2].
- Diagnosis is made through ECG and telemetry, and treatment is permanent pacemaker implantation (PPM).
- AVCA typically presents shortly after TAVR and are either treated or self-resolve during the index hospitalization. Although LBBB can precipitate CHB and PPM, one study found that only 6.7% of TAVR patients developed CHB after discharge[6]. Very few cases have reported CHB developing 1 year after discharge[7].
- In patients with risk factors for CHB such as LBBB, male sex, and valve prothesis type, recent data suggests continuous cardiac monitoring and early PPM to prevent adverse outcomes[8].
- Patients who undergo PPM after TAVR may also benefit from OMT's antiarrhythmic properties[9].

Conclusion

- The mainstream utilization of TAVR increases the incidence of AVCA in patients treated for aortic stenosis.
- Suspicion for the development of arrhythmias should extend past the acute post operative period into years post TAVR.
- Consistent follow up is imperative to monitor symptoms and to prevent sudden cardiac death.