

# Recurrent angina from chronic coronary obstruction following transcatheter aortic valve implantation

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## ABSTRACT

Severe aortic stenosis and coronary artery disease often coexist. Coronary angiography (CA) and percutaneous coronary intervention (PCI) can be challenging in patients with prior transcatheter aortic valve implantation (TAVI). Depending on the type and position of the implanted valve, the procedure can be challenging or even unfeasible due to interference of diagnostic catheters and valve parts. The correct positioning of the TAVI prosthesis during TAVI was identified as an important factor with regard to the feasibility of subsequent CA or PCI. TAVI has been also associated with vascular, cerebrovascular and conduction complication. One is rare but life-threatening complication, coronary ostial obstruction. Coronary ostial obstruction can develop, especially if a safety check of more than 10 mm of coronary ostial height is not taken into consideration during TAVI. This complication can cause recurrent episodes of angina and can severely worsen the patient's cardiac systolic function.

**Key words:** Angina, aortic valve, coronary obstruction

## INTRODUCTION

Surgical replacement of the aortic valve is contraindicated in many patients suffering from severe aortic stenosis and other comorbidities. The transcatheter approach comes to the rescue as a less invasive treatment in these high-risk patients. Coronary artery disease is common in this age group and usually coincide with severe aortic stenosis. Coronary angiography (CA) and percutaneous coronary intervention (PCI) can be challenging in patients with prior transcatheter aortic valve implantation (TAVI). TAVI has been associated with vascular, cerebrovascular, valvular, and conduction complications. A rare, life-threatening complication of TAVI is a coronary ostial obstruction. This report describes a patient who presented with recurrent angina and signs of ischemia on electrocardiogram (EKG) with severely depressed systolic function likely secondary to coronary artery disease progression or ostial obstruction after undergoing TAVI.

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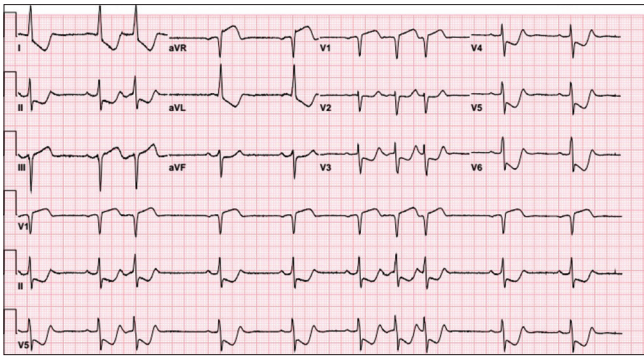
## CASE REPORT

We present the case of an 85-year-old woman with critical aortic stenosis who underwent 23-mm Medtronic CoreValve implantation 5 months before admission. She presented with typical symptoms diagnostic of recurrent angina in addition to exertional dyspnea, orthopnea, and leg edema. Physical examination revealed normal vital signs, but with jugular venous distention, bibasilar crackles, and lower extremity edema. No gallops or murmurs were appreciated on examination. Abnormal laboratory findings were consistent with a mild renal insufficiency and included an elevated pro-brain natriuretic peptide. EKG showed paroxysmal atrial tachycardia with ST-depression in the anterolateral and inferolateral leads [Figure 1]. The patient was admitted

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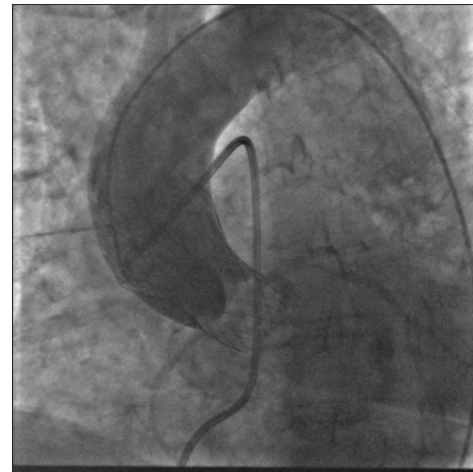


**Figure 1:** Electrocardiogram showed paroxysmal atrial tachycardia and ST-depression in the anterolateral and inferolateral leads

with the diagnosis of acute decompensated heart failure and was treated with diuretics. An echocardiogram demonstrated severely depressed systolic function with an ejection fraction <15%, compared to 45% before her TAVI 5 months earlier. Considering the patient's worsening systolic function, recurrent angina, and decreased functional capacity, she underwent cardiac catheterization. An ascending aortography was performed using 5-French pigtail catheter. During ascending angiography, the valve leaflets were seen to be opening, however, the leaflets of the CoreValve are not superimposed on the calcific retained leaflets of the initial valve and coronary ostial obstruction was suspected due to high implantation of the CoreValve [Figure 2]. Furthermore, poor positioning of the valve prevented unselective ostial cannulation and CA or any possible PCI could not be achieved if any lesion was to be found. Subsequently, the patient developed respiratory distress and cardiogenic shock, and an intra-aortic balloon device was inserted for circulatory support. Unfortunately, patient expired from refractory cardiogenic shock.

## DISCUSSION

TAVI is an acceptable and successful alternative to surgical aortic valve replacement in high-risk patients.<sup>[1]</sup> CA and PCI can also be challenging in patients with prior TAVI. TAVI is associated with known vascular, cerebrovascular, valvular, and conduction complications. Coronary ostial obstruction is a rare, yet life-threatening, complication associated with TAVI. Scarce clinical data is available on this important complication as it has been reported in case reports and small case series with an estimated incidence of <1%.<sup>[2,3]</sup> A systematic review of reported cases suggests that it occurs more frequently in women without prior CABG, and in patients receiving a balloon-expandable valve. However, this complication has not been evaluated in comparative studies of CoreValve and SAPIEN transcatheter valve models.<sup>[4]</sup> The most common mechanism of coronary obstruction after



**Figure 2:** Cardiac catheterization image shows the high position of the CoreValve and poorly filling coronary vessels below the aortic valve

TAVI is the displacement of the calcified native cusp over the coronary ostium resulting in perioperative ischemia. To date, there are no reported cases of coronary obstruction directly related to the transcatheter valve struts, leaflets, or cuff. However, the low position of the coronary ostia with respect to the aortic annulus is a major contributing factor to ostial obstruction. A coronary ostia height cut-off of < 10 mm increases the risk of coronary obstruction after TAVI.<sup>[5,6]</sup> In retrospective analysis of 1000 patients with prior TAVI, all cases where prostheses had been implanted in the supracoronary position, coronary arteries were displayed unselectively, and full stability and push of the guiding catheter was compromised.<sup>[7]</sup> Our case illustrates the importance of proper TAVI positioning to avoid a potentially life-threatening complication. It is also critical to know that correct positioning of TAVI is an important factors for the feasibility of CA and PCI. We also emphasize to keep these complications in mind when TAVI patients show a similar presentation.

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## Conflicts of interest

There are no conflicts of interest.

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