

Case Study

Novel Technique for TAVR in Patient With Coronary Obstruction Risk

The patient is a 71 year old female with multiple co-morbidities including atrial fibrillation, HTN, HL, significant COPD, obstructive sleep apnea, type II DM, has presented with episodes of acute hypoxic respiratory failure necessitating mechanical ventilation. These episodes were deemed to be a combination of heart failure, atrial fibrillation and COPD. Of note she had undergone cardiac surgery for aortic stenosis in 2014 with placement of a 21 mm Trifecta valve (Edwards Lifesciences). Her bioprosthetic aortic valve had undergone significant deterioration. An echo suggested severe aortic stenosis with a mean gradient of 45 mmHg, a peak gradient across the valve of 4.5 M/sec and an aortic valve area of 0.65 cm². Her left ventricular function was normal. A coronary angiogram did not reveal any significant lesions. Because she was considered high risk for repeat surgery (STS score 7.3%) she was considered a potential candidate for a valve-in-valve TAVR (trans-catheter aortic valve replacement). CT imaging of the chest, abdomen, and pelvis are routinely carried out in order to assess the caliber, tortuosity, and calcification of the aorta and peripheral arteries, the dimensions and calcification of the annulus, the dimensions of the aortic root and the position of the coronary arteries. In this particular patient the left coronary artery was noted to be extremely low and was at risk for occlusion due to pinning open of the original bioprosthetic valve leaflets after placement of the new TAVR valve resulting in leaflet covering the coronary ostium and coronary occlusion which carries a high risk of myocardial infarction and mortality. A new technique referred to BASILICA (Bioprosthetic or Native Aortic Scallop Intentional Laceration to Prevent Iatrogenic Coronary Artery Obstruction) involves using wire-transmitted electrical energy to perforate the leaflet of the bioprosthetic valve and lacerate the leaflet prior to placing the TAVR valve (see figures below). This results in a splitting of the leaflet so that when the new valve is placed there is no compromise of coronary blood flow due to leaflet obstruction. The procedure was carried out successfully. A 23 mm Evolute Valve (Medtronic) was placed. At the end of the procedure the new valve was in good position and coronary perfusion was maintained.

