Carcinoid tumors may pose a significant challenge for an anesthesiologist in perioperative settings. We present a case of an 80-year-old female who was initially admitted to our hospital with an exacerbation of chronic heart failure secondary to severe aortic stenosis. Her extensive past medical history was marked by an aortic valve replacement 14 years ago and a pulmonary carcinoid tumor treated with octreotide. After medical workup and optimization, she was scheduled for a transfemoral transcatheter aortic valve replacement (TAVR). Her valve-in-valve TAVR was performed under anesthetic sedation with invasive blood pressure monitoring, avoidance of medications with a high potential for histamine release, minimizing stress, optimizing physiologic conditions of respiration and temperature control, and careful titration of direct-acting vasopressors to maintain hemodynamic stability. Post deployment of a CoreValve (Medtronic), transthoracic echocardiogram was done revealing no evidence of stenosis or regurgitation of the prosthetic aortic valve, as well as no significant pericardial effusion. After the procedure, the patient recovered well and was discharged from the hospital on post-operative day five without symptoms.