INTRODUCTION: The transcaval approach to aortic valve replacements is a novel approach to transcatheter aortic valve replacements (TAVR). TAVRs are an alternative to surgical aortic valve replacement in patients with severe aortic stenosis and high to prohibitive surgical risk. Multiple approaches have been utilized, however it has been found that transfemoral access is superior to transthoracic (transapical and transaortic). In patients with severe peripheral vascular disease however, transfemoral approaches are unavailable for intervention. The transcaval approach is a novel alternative that has been successful for those ineligible for femoral artery access. Here we present a patient who underwent a TAVR through transcaval approach.

CASE PRESENTATION: The patient is a 74-year-old male with known severe aortic stenosis presenting with 1.5 years worsening dyspnea on exertion scheduled for TAVR with transcaval approach. The patient had a previous history of severe peripheral vascular disease, cold agglutinin disease, aplastic anemia, pulmonary hypertension, chronic obstructive pulmonary disease, NYHA Class III heart failure, and prior history of pulmonary embolism with GI bleed on Eliquis. Preoperative anesthesiology evaluation was not remarkable for new medical findings. Preoperative EF was 50% with trace aortic insufficiency. Mean gradient was 53mmHg, valve area index was 0.6 cm²/m² and velocity across the valve was 3.81m/s. After placement of monitors and an A-line, general anesthesia was induced with etomidate to maintain hemodynamic stability. A phenylephrine drip was required throughout the procedure as is usual with transcatheter aortic valve replacements. The patient’s temperature was maintained between 36-37°C throughout the case. The patient tolerated the procedure without incident. Post-procedure, the patient’s hematocrit dropped and he became hypotensive requiring pressors and 4 units of pack red blood cells. A CT scan subsequently revealed a large right-sided retroperitoneal hematoma requiring an aortic stent and vascular surgery with a femoral-femoral bypass. The patient could not be anticoagulated during this episode and subsequently developed multiple subsegmental pulmonary emboli. He had an IVC filter placed and was started on heparin drip with Coumadin. Upon discharge, he had an INR of 2.2 and was able to ambulate with minimal dyspnea.

DISCUSSION: The transcaval approach to transcatheter aortic valve replacement has numerous risks including retroperitoneal hematoma, bleeding, and aortic dissection/perforation. Cold agglutinin disease is an autoimmune hemolytic disease caused by the presence of antibodies against red blood cells which react to cold. It is thought that patient’s anemia was secondary to hemolysis (↑LD, ↓haptoglobin) due to his autoimmune hemolytic anemia and retroperitoneal bleeding. Transcatheter aortic valve replacements avoid the complications of hypothermia required for open
heart procedures in patients with cold agglutinin disease, however a high degree of suspicion is necessary throughout and immediately post-transcaval TAVR in these patients.