

SVC Syndrome Following Orthotopic Heart Transplantation Resolved Via AngioJet Thrombolysis: A Case Report

Kristen L. Sessions, B.S.¹, Jason H. Anderson, M.D.¹, Jonathan N. Johnson, M.D.¹, Nathaniel W. Taggart M.D.¹

Background

Venous thromboembolism (VTE) is a known complication of solid organ transplantation, including heart transplantation, and can be life-threatening. The incidence of VTE has been reported as 13 episodes per 1000 patient years in adult heart transplant recipients with risk factors for developing a VTE including altered hemodynamics, presence of central venous catheters, and coagulation disturbances. The incidence of VTE following heart transplantation in children has not been reported. To date, no prospective studies have been conducted to determine the safest and most effective treatment of acute thrombosis following solid organ transplant.

Case Report

We present a 12-year-old girl with a history of hypoplastic left heart syndrome with a single right superior vena cava (SVC) palliated with a nonfenestrated extracardiac Fontan. Eight years after developing protein losing enteropathy, she underwent bicaval orthotopic cardiac transplantation. Nine days following the procedure, the patient developed headache, hypoxia, upper extremity edema, facial swelling, and cyanosis. Echocardiography suggested complete occlusion of the SVC with a dilated, decompressing innominate vein. Cardiac catheterization was emergently performed demonstrating a mean SVC pressure of 34 mmHg and mean right atrial (RA) pressure of 17 mmHg with near complete occlusion of the SVC with thrombus extending from the left innominate vein to the surgical SVC-RA anastomosis. A 6 French AngioJet™ system (Boston Scientific, Marlborough, Massachusetts) was advanced to the RA with mechanical thrombolysis performed along the length of the obstruction followed by balloon angioplasty utilizing a 10 mm by 3 cm Z-Med II balloon. Repeat SVC angiography demonstrated re-establishment of SVC flow with no residual obstruction or gradient on hemodynamic assessment.

Discussion

To our knowledge, this is the first successful endovascular mechanical thrombolysis for acquired SVC thrombosis causing SVC syndrome following bicaval orthotopic heart transplantation. The AngioJet™ system has been widely used in adult patients and has been proven to be safe and effective in thrombus removal in adults with acute myocardial infarction. This case demonstrates that it may also serve a role in transplant patients as this modality allowed for resolution of acute SVC syndrome without the necessity for a repeat sternotomy and surgical thrombectomy.