

Stent Implantation for Extracardiac Conduit Fontan Stenosis: Indications and Outcomes

Brielle Haggerty, MD (PGY-2)¹, Jason Anderson, MD², Jonathan Johnson MD, PhD², Frank Cetta, Jr., MD², Allison Cabalka, MD², Nathaniel Taggart, MD²

1 Department of Pediatric and Adolescent Medicine, Mayo Clinic, Rochester MN

2 Department of Pediatric and Adolescent Medicine/Division of Pediatric Cardiology, Mayo Clinic, Rochester MN

Background: Stent implantation can be used to relieve obstruction in patients after Fontan operation, however data is limited in regards to patients requiring stenting of an extracardiac (EC) Fontan conduit.

Objective: Describe the characteristics and outcomes of patients with EC who require stent implantation for conduit obstruction.

Methods: We conducted a retrospective review of patients who had EC Fontan performed Mayo Clinic between 1975-2012. We identified those that had transcatheter stent implantation for conduit obstruction.

Results: 1137 patients underwent Fontan operation at Mayo Clinic between 1973-2012. There were 134 patients (12%) who had an EC Fontan, of whom 8 (6 male, ages 9-24) underwent stent placement for conduit obstruction. Median conduit size at initial implantation was 19 mm. All patients had angiographic evidence of stenosis; additionally, one patient had protein losing enteropathy (PLE) and one Fontan-associated liver disease. Stents were placed average of 7.8 years after Fontan procedure. Median pre-procedure pressure gradient across the conduit was 2 mmHg. The median pre-procedure minimal conduit diameter was 8 mm, improving to 15 mm after stent implantation ($p < 0.05$). The Fontan conduit pressure decreased by a median of 3 mmHg post-procedure. Three patients required additional stent placements 3, 5, and 6 years afterwards. The patient with PLE had resolution for 6 months but required repeat stent placement 3 years later, and ultimately heart transplant 5 years later for relapsing PLE.

Conclusions: Conduit stenosis is an uncommon late finding with EC Fontan patients, and can be effectively treated with stent implantation. Transcatheter re-intervention was common in our series. Larger studies are needed to establish indications for stent placement and assess long-term clinical benefit.

Figure 1: Pre and Post EC Fontan stent placement

