Obstruction of the extracardiac conduit in children following the Fontan operation: Feasibility and results of percutaneous transcatheter stenting

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Objectives: An increasing number of Fontan patients have been reported with a significant obstruction of their extracardiac tunnel. No study has systematically examined the feasibility and the results of percutaneous transcatheter stenting of the extracardiac conduit in these patients.

Method: Our institutional database was searched to identify all Fontan patients with a significant obstruction of their extracardiac conduit who underwent percutaneous transcatheter stenting. Medical records, cardiac catheterization data, and echocardiographic investigations were reviewed.

Results: From 2011 to 2013, 10 transcatheter stenting procedures of the extracardiac conduit were performed. Patients presented with protein-losing enteropathy (n = 7), exercise intolerance (n = 2), and cyanosis (n = 1). An obstruction was suspected on echocardiography in only 4/10 patients. Median age at cardiac catheterization was 4.2 years (range 2.4 – 10.2 years). The median size of the stenosed area was 41 % (range 28 - 85 %). Collateral vessels were seen in 8/10 patients. We implanted 12 bare metal stents (Palmaz 4014 or 308) in 10 patients. The stents were balloon-dilated to the original size of the implanted extracardiac conduit (n = 16 mm in 7 patients, n = 18 mm in 3 patients). A unobstructed extracardiac conduit was established in all patients. No procedural complications occurred. A re-intervention was needed in 1 patient. The median follow-up after stenting was 8 months (range 1 – 12 months). Clinical improvement and reduction of edema was noted in all patients. However, relapses of protein-losing enteropathy occurred in all.

Conclusion: A significant obstruction of the extracardiac conduit can be encountered in a subset of patients early after Fontan completion. The feasibility and acute results of percutaneous transcatheter extracardiac conduit stenting are promising and should be recommended as the first line of treatment.