

Early Experience with the Bentley Be-Graft Stent in Treatment of Aortic Coarctation and Pulmonary Artery Stenosis in Children

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Introduction: Transcatheter stent therapy for aortic coarctation in older children and adolescents has over the past decade become a frequent treatment strategy of choice. Favorable properties of stents for coarctation include 1) high radial strength at maximal inflation diameter, 2) limited foreshortening, and 3) low profile. The Bentley BeGraft aortic stent arrived on the European market in 2016 and is a premounted, balloon expandable, covered stent indicated for the use of native or recurrent CoA. Here we report our first eight pediatric cases of using this stent for aortic coarctation and one case of pulmonary artery stenosis.

Methods: Between November 2016 and November 2018 Bentley BeGraft stents were implanted at our center in aortic coarctation of eight patients with native membranous aortic coarctation near the isthmus. Mean age was 9.9 years (range 4.0-14.3) and mean weight 38.0 kg (range 19.4-58.7). All patients had pre-procedure CT or MR imaging. Acute outcome evaluation was based on angiography (Image) and change in coarctation pressure gradient. Short term outcome was evaluated by clinical assessment and follow-up CT scan and chest x-ray performed 4-6 months after stent implantation. Placement of the stent in the pulmonary artery was performed in a 4 year-old TCPC-operated single ventricle patient.

Results: Invasively measured coarctation gradients ranged 16-31 mmHg (mean 25) and were reduced to 3 mmHg or less in six of eight patients. Stents that were inflated to nominal pressure reached their expected diameter (12 or 14 mm). There were no acute or short term complications related to the procedure. There was minimal to no recoil and no fracture at 4-6 months follow-up. All patients were clinically well at follow-up. Follow up results on the pulmonary artery stent is expected shortly.

Conclusions: Based on our initial clinical experience this has a high ease of use with a rapid operator learning curve, favorable low profile allowing for uncomplicated use in patients 20 kg and above, and it shows minimal recoil at 6 months. In summary, our early results support that the Bentley BeGraft stent is suitable for use in aortic coarctation in older children and adolescents.

