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Percutaneous treatment of aortic isthmus atresia: use of radiofrequency perforation and covered stents

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BACKGROUND: Limited data exist in literature concerning the percutaneous treatment of aortic isthmus atresia.

PATIENTS AND METHODS: Between January 2007 and November 2010, 40 subjects underwent percutaneous treatment of aortic coarctation in our catheterization laboratory. Four out of 40 had complete aortic isthmus atresia. Median age at procedure was 48 years (range 32-63 years). All subjects had history of arterial systemic hypertension refractory to medical treatment. Two subjects had a previous history of brain bleeding. All procedures were performed under general anesthesia and orotracheal intubation. Radial and femoral artery access were obtained. Radiofrequency system (Baylis MedComp Inc, Montreal, Canada) consisting in a Nykanen 0.024" RF guidewire and a coaxial microcatheter were used to perforate the atretic segment. Guidewire was snared and an artero-arterial circuit was created. The area was pre-dilated by using coronary angioplasty balloons. A 12 Fr Mullins long sheath was advanced and an E-PTFE covered 8Zig Cheatham-Platinum stent was implanted. Patients were monitored in hospital for 48-72 hours. Follow-up was performed at 1, 3,6,12 months and yearly thereafter.

RESULTS: Percutaneous recanalization of the atresia was performed successfully in all subjects. Mean fluoroscopy and procedure times were 30 +/- 6 and 90 +/- 15 minutes, respectively. After implantation, the gradient decreased significantly (pre stent: mean value 52.25 mm Hg [range 33-70 mm Hg] versus post stent: mean value 3 mm Hg [range 0-10 mm Hg] [P < .0001]). The stents were placed in the correct position in all subjects. No complications occurred. During a mean follow-up of 19 months (2-41 months), the results were stable without complications. All subjects had a perfectly normal arterial systemic pressure. In two out of 4 patient one anti-hypertensive drug was needed. One patient needed further stent dilation because of a conservative approach. Procedure was performed 8 months after the initial stent implantation without problem.

CONCLUSIONS: Our data show that use of radiofrequency energy and Covered CP stents is a safe, effective and promising tools for treatment of aortic isthmus atresia.