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Treatment of extremely tortuous and hypoplastic aortic arches by implantation of JOTEC™ E-XL Aortic Stents

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Introduction:

Extremely tortuous aortic arches combined with arch hypoplasia and stenosis is a rare finding. Even after successful stenting of the transverse arch, the blood pressure may stay high because of the anatomical course of the aortic arch. Therefore in many centers a surgical approach is preferred. The E-XL Aortic Stent (JOTEC GmbH, Hechingen, Germany) was initially manufactured for aortic lesions e.g. dissections. It has an open cell design in the middle section and a closed design at its ends. This retrospective study describes the immediate effectiveness of these stents in this specific patient group.

Methods:

We report on three patients (9, 11 and 23 years) with the described anatomy who were treated in our center during the past 3 months. Despite successful stent-implantation in the transverse arch region, a relevant brachiocephalic hypertension and resting blood pressure gradient (20-40 mmHg) remained. After adequate angiographic documentation and measurements of the anatomy, the optimal stent size was selected. In two patients (9 and 11 yrs.), 18 x 70 mm E-XL Aortic Stents were implanted using a 12F delivery system, in the GUCH-patient a 24 x 100 mm stent was used via a 14F sheath by a transfemoral approach.

Results:

In all cases, stent implantation was successfully performed without complications. Due to the length and size of the stents implanted, the aortic arches were straightened up and their diameter adequately extended in all patients. Only minimal residual pressure gradients (< 10 mmHg) were documented immediately after implantation. No long time effects are seen so far due to the short follow-up time.

Discussion:

Extremely tortuous aortic arches with hypoplasia and stenosis usually cause brachiocephalic arterial hypertension and interventional treatment may be a therapeutic challenge. The combination of the closed cell design with a high radial force at its ends and the open cell design in the middle section makes the E-XL Aortic Stent an interesting alternative to common stent implantation in these patients. Kinking seems to be avoided and the tortuous anatomy can be straightened up. This combination makes these stents useful offer these challenging patients an interventional treatment modality.