Endovascular solutions for coarctation of the aorta in the adult

Antonio Duarte, MD, Division of Vascular Surgery, Heart and Vessels Department, Unidade Local de Saúde Santa Maria, Lisbon, Portugal
Alice Lopes, MD, Division of Vascular Surgery, Heart and Vessels Department, Unidade Local de Saúde Santa Maria, Lisbon, Portugal
Pedro Amorim, MD, Division of Vascular Surgery, Heart and Vessels Department, Unidade Local de Saúde Santa Maria, Lisbon, Portugal
Luis Mendes Pedro, MD, PhD, FEBVS, Division of Vascular Surgery, Heart and Vessels Department, Unidade Local de Saúde Santa Maria, Lisbon, Portugal

Objective:
While most commonly found in neonates, coarctation of the aorta may go unnoticed until adulthood, with serous lifelong complications. In adult patients, increased morbidity rates may hamper open repair. The following case reflects the benefits of novel endovascular approaches for treating coarctation of the aorta in adults.

Methods:
We report the case of a 32-year-old female referred to the outpatient clinic due to abnormal findings in limb ultrasound and arterial hypertension since the age of 24. She also had a history of systemic lupus erythematous. At physical examination, blood pressure was 154/94 mmHg measured in the right upper limb and 124/71 mmHg in the left lower limb. Femoral pulses were not palpable bilaterally. Doppler ultrasound showed monophasic flow bilaterally from the common femoral arteries to the pedal arteries. CT angiogram revealed a >50% narrowing of the descending thoracic aorta and increased collaterality through the intercostal arteries.

Results:
Under general anesthesia and bilateral femoral cutdown access, the coarctation was crossed with a hydrophilic 0.035 guidewire. Initial angiogram confirmed successful crossing of the lesion (figure 1). The coarctation was predilated with 8x40mm and 10x40mm compliant balloons, followed by the deployment of a 16x48 balloon-expandable Bentley BeGraft® Aortic covered stent (Bentley InnoMed, Hechingen, Germany). The patient was discharged on the second postoperative day with bilateral pedal pulses and no blood pressure gradient. At three months, CT reconstruction showed patency of the aortic stent (figure 2). At one year follow-up, the patient is pregnant with no antihypertensive therapy and no obstetric complications to date.

Conclusion:
Treatment of coarctation of the aorta in the adult is indicated in hypertensive patients with increased pressure gradient between upper and lower limbs and a higher than 50% narrowing of the aorta at the level of the coarctation, as in this case. Open surgery is typically performed in neonates, with discouraging results in adults. Early reports on endovascular treatment of this condition show favorable results with a 5-year survival rate of 89%. Recent registries with balloon-expandable covered stents in adults look promising with low reintervention rates. Minimally invasive approaches may therefore be a viable solution, especially at a young and active age.

Fig 1 Initial angiogram of the coarctation

Fig 2 Follow-up CT reconstruction of the aorta